THIS WEEK'S National Petroleum NEWS

Coming Meetings

Third International Conference on Bituminous Coal, at Carnegie Institute of Technology, Schenley Park, Pittsburgh, Pa., Nov. 16 to 21.

Indiana Petroleum Association, Hotel Severin, Indianapolis, Ind., Dec. 2, 3.

Nebraska Petroleum Marketers, Inc., Hotel Paxton, Omaha, Neb., Dec. 9, 10, 11.

Geological Society of America. Mayo Hotel, Tulsa, Dec, 28 to 31.

1932

Northwest Petroleum Association, North Dakota division, Waldorf Hotel, Fargo, N. D., Jan. 11, 12.

Northwest Petroleum Association, Minnesota division, Radisson Hotel, Minneapolis, Minn., Jan. 14, 15.

Oklahoma Petroleum Marketers Association, Oklahoma City, Jan. 21, 22.

Society of Automotive Engineers, Detroit, Mich., Jan. 25 to 29.

The Kentucky Petroleum Marketers Association, Brown Hotel, Louisville, Ky., Feb. 9.

Ohio Petroleum Marketers Association, Deshler-Wallick Hotel, Columbus, O., Feb. 23, 24, 25.

American Association of Petroleum Geologists, Oklahoma City, Okla., March 17, 18, 19.

National Petroleum Association, Hotel Cleveland, Cleveland, O., April 21, 22.

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EDWIN B. REESER, has been the "trouble shooter" the past three years for the oil industry. In this period when the majority of the companies in the oil industry voluntarily imposed upon themselves restraint in their operations, to bring the industry back to more stable operations, there have been times when it appeared the self imposed barriers were breaking. Those moments found Mr. Reeser seizing a bag, always kept packed, and rushing off to New York, California, Texas—wherever trouble was brewing.

The biggest accomplishment of Mr. Reeser's administration is his having a large part in the assembling of the machinery by which the industry will co-ordinate its efforts to meet its major problems. That machinery will function in improved fashion in the future, although it may creak and groan in alarming fashion at times.

(See article page 37)

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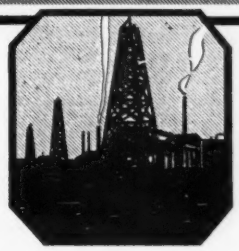

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Vol. 23 **CLEVELAND, NOVEMBER 11, 1931** **No. 45**

Further Restriction in Crude Production And Refinery Runs is Needed

CHICAGO, Nov. 9

FURTHER restrictions in the production of crude oil and in refinery manufacture of gasoline, in the face of recent advances in the price of crude, are recommended to the industry in a report of the Voluntary Committee on Petroleum Economics of the Federal Oil Conservation Board.

The report was made public here today, in connection with the assembling of men active in the industry, for the annual meeting of the American Petroleum Institute. The committee made a similar report at the meeting a year ago. The present report covers the nine months, Oct. 1 to June 30, 1932. A year ago the committee forecast supply and demand for the six months to April 1.

Later, during this meeting, institute directors will also have a report on crude oil and gasoline supply and demand, to July 1 next, from its own committee on refinery statistics and economics. The two reports will be studied and issued to the industry generally for the guidance of individual company operations over a period which will be critical as far as profits for 1932 are concerned.

The apparent paradox of recommended restrictions in supply, just after an advance in the price of crude, is to be explained by the fact that supply and demand has been held in the degree of balance that has been attained this year through proration, and that the industry is now entering its period of lowest demand, which will be relatively even less this winter and next spring because an actual decline in motor fuel demand is predicted from the same period a year ago.

Also—which fact was taken by some here to indicate that crude demand from refineries will be lower than set up in the report made public today—what reduction in gasoline manufacture is made will be in straight-run gasoline, where it is transferred four-fold to crude supply.

Due to the demand for higher anti-knock gasolines cracking operations will be carried on at the present rate, perhaps increased, some students of refinery economics believe, since they are the source of higher anti-knock fuels than can be secured through straight distillation. The necessary curtailment in crude supply will be larger than if cracked and straight-run gasoline production is cut back in equal proportions.

The federal oil board's subcommittee says: "A program which would consider the stability and continuity of refining operations and the adjustment of supply to probable demand would require a total of 653,340,000 barrels of domestic crude oil for the nine months Oct. 1 to July 1, 1932, or a daily average of 2,384,000 barrels. This economic requirement would include the supply of crude oil both from production and through stock withdrawals."

TAKING the figure of 2,379,000 barrels daily of crude output as the maximum allowable for this country for the rest of this year and 1932, as set up recently by a group of operators and representatives of state agencies concerned with conservation efforts, the committee has this to say:

"If actual operations follow the trend of economic requirements as outlined, a daily production of 2,379,000 barrels would supply virtually all of the requirement and withdrawals from storage would be negligible."

The committee's analysis of

Estimated Domestic Motor Fuel Demand, Oct. 1, 1931 to June 30, 1932

(From the Report of the Committee on Economics of the Federal Oil Conservation Board)

Month 1931	Average number motor vehicles in use	Difference From '30-'31	Average Cons. per Vehicle (Barrels)	Total (Barrels)
Oct.	23,933,500	—528,300	1.42	33,985,000
Nov.	23,708,600	—499,600	1.35	32,005,000
Dec.	23,433,100	—466,800	1.22	28,585,000
1932				
Jan.	23,036,600	—417,900	1.18	27,180,000
Feb.	23,152,500	—398,200	1.21	28,055,000
March	23,294,100	—359,200	1.35	31,445,000
April	23,516,000	—286,200	1.44	33,860,000
May	23,807,900	—214,500	1.50	35,710,000
June	24,060,400	—133,100	1.59	38,175,000
Estimated Domestic Motor Fuel Demand				289,000,000

crude supply and demand for the nine-month period is as follows: Domestic crude refinery throughout, 608,440,000 barrels; imported crude 24,660,000 barrels; total refinery requirements, 633,100,000 barrels, or 2,311,000 barrels daily. Crude exports are placed at 25,600,000 barrels, crude used as such at 19,300,000 barrels and total crude requirements at 678,000,000 barrels.

On the basis of total requirements of 653,340,000 barrels of domestic crude oil for the nine months, the daily average supply varies from an estimated 2,440,000 barrels in October, to 2,400,000 barrels in November, 2,212,000 barrels in December, 2,206,000 barrels in January, to a high of 2,541,000 barrels in June.

As against the recommended figure for domestic requirements, of not much over 2,200,000 barrels daily in the coming two months, domestic crude output now is about 2,400,000 barrels. Refineries are running probably even a little larger amount of crude to stills under their present programs. A reduction in domestic crude production of about 10 per cent is indicated as necessary to stabilize operations over the winter.

For the nine-month period, the oil board's committee anticipates an increase of only 1.9 per cent in domestic motor fuel demand, and a decline of 19.2 per cent in foreign demand. Total motor fuel demand is placed at 0.6 per cent less than in the nine months ended June 30, 1931. The average number of motor vehicles in use at present is estimated at between 2 and 3 per cent less than a year ago, but this is partly offset by the fact that cars in use are being operated more frequently, or over longer distances, says the committee's report. It cites tourist travel in national and other public parks this summer as compared with last and an increase in number of taxicabs as being among the reasons for a slightly increased consumption per average motor vehicle in use today.

"General business or industrial conditions influence motor fuel demand," the committee's report goes on. "It would appear, however, that adverse business conditions tend more to limit normal growth in demand, rather than to cause any sharp decline in demand from vehicles already in use. The curve of motor fuel demand lags behind the swings of the business cycle. An apparent reason for this is that trends in automobile production influence business conditions beginning with the acquisition of raw materials for manufacture, while motor fuel demand is not influenced until the completion of the vehicles."

An increase of 1.9 per cent in domestic motor fuel demand, in the nine months under consideration, would call for 289,000,000 barrels, and compares with 283,690,000 barrels for the same period a year ago. Imports of gasoline for the present nine-month period are placed at 30,945,000 barrels, as against 38,-

(*Continued on Page* 22)

Estimated Refinery Shipments, Stocks, and Production of Gasoline by Districts

(From the Report of the Committee on Economics of the Federal Oil Board)

(Figures in Thousands of Barrels)

REFINERY DISTRICT:	Shipments	Stocks* Oct. 1, 1931	Stocks* June 30, 1932	Change†	Gasoline production	Crude Throughput	Ratio Gasoline to Crude Per Cent
East Coast	48,000	3,897	4,647	750	48,750	118,900	41.0
Appalachian	11,500	1,394	1,494	100	11,600	23,920	48.5
Indiana-Illinois-Kentucky	45,600	4,684	5,228	544	46,145	75,700	61.0
Oklahoma-Kansas-Missouri	44,600	2,919	3,274	355	44,955	77,600	58.0
Inland Texas	22,315	2,084	1,800	—284	22,030	42,330	51.5
Texas Gulf Coast	52,500	3,547	4,607	1,060	53,560	107,100	50.0
Louisiana Gulf Coast	12,500	626	1,121	495	12,995	28,880	45.0
Northern Louisiana-Arkansas	6,200	244	149	— 95	6,105	13,570	45.0
Rocky Mountain	8,750	1,395	1,595	200	8,950	14,200	63.0
California	54,545	12,538	12,103	—435	54,110	130,400	41.5
Total United States	306,510	33,328	36,018	2,690	309,200	633,100	48.839

*Stocks east of California are those held at refineries; California stocks include total inventories of finished gasoline and engine distillate held by California companies within Continental United States (Stocks at refineries, water terminals, and sales distributing stations, including products in transit thereto).

†Unless indicated by (—), change shown represents addition to storage.

THE EDITORS' VIEWPOINT

The Interest of the Natural Gas Industry

ONE approach to the problem of the proper regulation of crude supply which has not received the proper amount of consideration, it seems to us, is that of the interest of the public in the supply of natural gas which accompanies the production of crude oil, and the interest of the natural gas industry in serving the public with this resource.

C. B. Ames, vice-president of The Texas Co., brought up this point in an address at the meeting of the American Petroleum Institute last year. A few days ago, speaking on "Petroleum and the Law" at a conference in New York on the relation of law and business, he introduced his address with a reference to the same subject.

"Approximately two billion cubic feet of gas are being blown into the air every day," he said. "In 1930 there were 5,448,000 domestic consumers of natural gas who used a total of 376,407,000,000 cubic feet, or a little more than one billion cubic feet per day.

"We are, therefore, blowing into the air approximately twice as much natural gas as is being used by 5,448,000 domestic consumers.

"This is a three-fold waste. It wastes the gas itself, but the gas which is being wasted is bringing to the surface an excessive quantity of oil, which results in wasteful use and inadequate price, and, in addition, this wasted gas is bringing to the surface its natural gasoline content, which, in turn, is crowded into an unwilling market to the detriment of the industry as a whole."

When considered together with the great growth of the natural gas industry the past few years, these remarks have particular significance. A natural gas supply in any part of this country, because of the greater efficiency and relatively lower cost of construction of long distance gas lines, is not now a doubtful resource to the public, as it was even a few years ago. Given the supply and the assurance it will not be dissipated into the air in great part, that resource is now a tangible reserve for the gas distributing industry.

Also, the natural gas industry has grown in the capital invested in it, in the number of engineers and able business men engaged in it. Its operations have become wider and its organization on a natural scale more aggressive. It has its problem of future reserves no less than does the oil industry, although the oil industry has largely forgotten this point the past year or so in grappling with an immediate oversupply.

It seems to us that this better organized natural gas industry, even if many of the men engaged in its operations are also engaged in the oil producing business, is not going to sit back for long and see a supply twice as great as that now actually being used, dissipated in the air, merely to bring to the surface a supply of crude oil which in itself is not needed.

The gas industry apparently does not need a great deal in the way of legal authority to challenge the dissipation of a supply in any field. The principal oil and gas producing states now by law prevent the "waste" of gas. This has generally been interpreted to mean the dissipation of the supply in a field then capable of being brought to a market. The waste of gas into the air, along with the production of oil, in fields not readily accessible to markets has not been questioned until recently.

ALMOST certainly, such waste will be more challenged in the future. With even restrained production of gas in new oil fields, the production of oil itself is greatly limited. The value of the gas in the ground as an aid in producing oil is being more largely recognized. It is possible the time may not be far off when a new oil field may not be developed until markets are assured for that amount of gas which must be produced with the oil. Taking any portion of the gas from a field, without aboveground or underground waste, means the development of both oil and gas operations there on some kind of unit development plan.

This is not as far in the future as it may sound. The Kettleman Hills oil field, in California, possibly as great or even a greater field than East Texas, is being developed on just this basis.

Judge Ames, concerned at the meeting of the institute this week in Chicago with a revision of the antitrust laws to allow oil companies to make agreements among themselves to arbitrarily restrict production of crude in oil fields, may have a strong ally in the gas interests in the not far distant future.

Any endeavor that would look to the conservation of the gas and produce only that for which a market can be found may restore the production of both gas and oil to prosperity.

Further Restriction Need

(*Continued from page* 20)

297,000 barrels a year ago. Total demand for the present period is placed at 319,945,000 barrels, as against 321,987,000 barrels in the previous period.

While additions to storage a year ago brought total motor fuel production to 327,889,000 barrels, an addition to stocks of only 2,690,000 barrels is contemplated this year, which would bring total production for the period ending June 30, 1932, to 322,635,000 barrels, 1.6 per cent less than total production a year ago.

The report continued in part:

"In this report, the committee has endeavored to outline a program which would contribute to the stability of refining operations and permit a furtherance in the efforts of the industry to reduce gasoline stocks to economic levels. It is felt that the gasoline stock levels indicated are possible of attainment and that a continuation of the trend would lead, at the close of the 1932 summer season, to stocks of approximately 28,000,000 barrels, or about the quantity indicated by the industry as adequate for working stocks at the close of a summer period.

"The indicated monthly refinery crude throughput was calculated so as to avoid sharp fluctuations in the monthly operating status; to reduce the probability of adding excessive quantities of gasoline to refinery storage during the period of the year in which stocks normally increase; and to adjust the probable fuel oil output sufficiently to offset the influence of the indicated decline in demand.

"A further curtailment of fuel oil production appears essential to the maintenance of economic stocks. Although gas oil and fuel oil production during 1931 has, for each month except August, been less than for the corresponding months of 1930, the stocks of these oils, east of California have been increasing. This indicates that an appreciable decline in demand, which is substantiated by such figures of consumption as are available.

"Bunker oil deliveries, in foreign and costwise trade, during the first eight months of 1931 were approximately 11 per cent less than in the corresponding period of 1930, while fuel oil consumed in the generation of electric power at central plants showed a similar decline. Fuel oil burned by locomotives on Class I railroads during the first seven months of 1931 was 14 per cent less than the consumption during the corresponding period of 1930.

"In view of the decline in fuel oil demand and the resulting stock increases, the manufacture from the crude oil of relatively more gasoline and less fuel oil appears to be essential to the maintenance of an economic balance in the oil industry. This may be accomplished through increased 'cracking' of by the increased production and utilization of natural gasoline.

"Increased motor fuel production through 'cracking' is possible with present facilities and some increase is anticipated in natural gasoline production, although the peak levels of 1930 are not expected. In the present report, consequently, crude runs at refineries are based upon a projected gasoline output equal to 48.839 per cent of the crude run. This is somewhat higher than the ratio (48.354 per cent) used in the preceding report and is definitely higher than the average ratio (47.854 per cent) reported for the nine months ended June 30, 1931."

Members of the oil board's committee were Martin Van Couvering, California geologist; Howard Bennette, manager, Western Petroleum Refiners' Association, Tulsa; Alfred G. White, National Industrial Conference Board; John W. Frey, Department of Commerce, Washington, and E. B. Swanson, Bureau of Mines, Washington.

Balance Sheet of Crude and Motor Fuel Demand and Supply Oct. 1, 1931 to June 30, 1932

(From the Report of the Committee on Economics of the Federal Oil Board)

	Period Ended June 30, 1931 (Barrels)	Period Ending June 30, 1932 (Barrels)	Change Per Cent§
Motor Fuel Demand:			
Domestic	283,690,000	289,000,000	1.9
Foreign	38,297,000	30,945,000	—19.2
Total Demand	321,987,000	319,945,000	— 0.6
Added to Storage:			
At Refineries	4,871,000	2,690,000	—44.8
Pipelines, etc.*	1,031,000	.....	.....
Total Requirement	327,889,000	322,635,000	— 1.6
Motor Fuel Supply:			
Refinery Production	312,069,000	309,200,000	— 0.9
Miscellaneous Production	5,124,000	3,800,000	—25.8
Imports	10,696,000	9,635,000	— 9.9
Total Supply	327,889,000	322,635,000	— 1.6
Crude Oil Demand:			
Refinery Throughput—			
a. Domestic Crude	614,774,000	608,440,000	— 1.0
b. Foreign Crude	39,468,000	24,660,000	—37.5
Total	654,242,000	633,100,000	— 3.2
Exports	17,124,000	25,600,000	49.5
Used as Such, etc.	21,076,000	19,300,000	— 8.4
Total crude Oil Demand	692,442,000	678,000,000	— 2.1
Crude Oil Supply:			
Domestic Production	629,236,000	651,846,000‡	3.6
Imports	39,764,000	24,660,000	—38.0
Drawn from Storage†	23,442,000†	1,494,000	—93.6
Total Crude Oil Supply	692,442,000	678,000,000	— 2.1

*No provision made for increases in gasoline pipeline storage. Quantities needed to be supplied from gasoline production in addition to that provided for.

†Includes all crude except California stocks of heavy crude and fuel oil.

‡Total for period at daily rate of 2,379,000 barrels.

§Unless indicated by (—), change represents increase.

Production Control, Its Need, Legality, Technic, Explained to A. P. I.

CHICAGO, Nov. 11

PRODUCTION control, which has been the subject of more general concern for five years than has any other phase of the oil industry, formed a central theme around which was built a most important part of the American Petroleum Institute's program for the Twelfth annual meeting.

Under the striking heading "The New Conception of Oil Production," three speakers of national renown developed the essential parts of the program of control which they, and a majority of the units in the oil business, are convinced is essential to final stability.

J. Edgar Pew, vice-president of the Sun Oil Co. and past president of the Institute, discussed the broad policies of control and conservation; John R. Suman, vice-president of the Humble Oil & Refining Co., outlined the principles governing equitable and efficient oil pool development and W. P. Z. German, general counsel for the Skelly Oil Co., who has been in the fore in defending the proration policies in Oklahoma against court attacks, spoke on the legal aspects of "equitable extraction and distribution of recoverable oil," meaning, ratable production by all operators in a common pool in proportion to their acreage interests.

Mr. Pew, early in his address on Wednesday afternoon, took the position that it is not altogether a fault of the industry that production methods have been economically unsound. The industry's weakness has been in production, but legal shackles have been more responsible than anything else, he said.

"In the producing branch we have been charged with recklessness, lack of vision and deliberate unconcern for the public interest," he said. "Of these accusations I enter the broadest denial. The industry has at great cost systematically applied the lessons of science and experience. Deeper wells, improved drilling machinery, the aid of the geologist and the geophysicist, have enabled us to reach producing horizons that, a few years ago, might as well have been in the moon; better control has largely ended the wastes of flush production."

Warning: "The industry has lost hundreds of millions of dollars in the past five years through its producing methods. The public has lost as much in values, and stands to lose yet much more in the future through increased prices.

"We are subjecting ourselves to the menace of injurious legislation—perhaps of having the industry itself, second greatest in the land, as we are proud to say, wrested from our hands.

"Have we forgotten what happened to the railroads a few years ago? 'Oh,' you say, 'but that was in a wartime emergency.' Yes, it was; but today, in a time of peace, we see the grip of martial law fixed on more than half the country's oil production."

TWO suggestions were submitted by Mr. Pew. One was unqualified adoption of a unit plan of production and the second, a companion to the first, the acceptance as fundamental of the principle that each owner in a pool is entitled to his equitable share in its oil and gas, as opposed to the present rule under which everybody gets out all he can in the quickest time.

"The oil industry under the old program of 'getting that fustest with the mostest wells', has built up a great business; but in doing so it has created a Frankenstein which bids fair to ruin its creator and destroy a most important national resource.

"Wallace E. Pratt, a recognized authority, recently estimated 10 billion barrels of oil in sight, and said we are now using 900 million barrels a year. He said it will take 30 years to produce this 10 billion barrels, and that during each year of this period we will have to develop one billion barrels of new discoveries, equal to 10 major fields; also, on the experience of the past 14 years we will require to explore three million acres per year by drilling 20,000 wells. Most of the three million acres thus explored will be eliminated from future consideration, as the production will come from about two per cent of the area explored.

"IF Mr. Pratt is right, the industry under our present procedure will drill in the next 20 years 400,000 wells at an average cost of $50,000; total, $20,000,000,000. On the other hand, scientific and non-competitive drilling would produce the same amount from one-half —or less than one-half—as many wells at one-half the expense; and when we had done that, we would still have half the recoverable oil left in the sands, because of better engineering practices under such a plan. In fine, unit development and equitable distribution promise to double our recoveries from a given field, at half the cost of drilling.

"Can we reject such a program? I say we do not dare. It seems to me that if the industry shall merit confidence in either its financial operations or in its attitude toward conservation, it must forthwith solve this, its greatest problem. To fail will be to admit that our industry can only be managed under martial law."

With the problem stated by

Mr. Pew, Mr. German enunciated the law, as found in decisions of courts, affecting the "new conception" of property rights in an oil pool. The right of a producer to take his equitable share, and no more, of the oil and gas in the pool has been adequately sustained by the courts, he asserted. Strengthening this conception is the recently acquired knowledge of the function of reservoir pressure (gas or water) in recovering oil and the correlative rights of producers to enjoy the use of this natural recovery agent.

NUMEROUS decisions were reviewed by Mr. German, all sustaining the second of Mr. Pew's requisites to production control.

With the problem and the law described, Mr. Suman set forth the remedy—the method of procedure. He had to assume, for purposes of outlining the scientific method of developing and exploiting an oil pool, that it would be possible to disregard entirely the surface property boundaries and all restrictions imposed by present laws against co-operative agreements in the production of raw materials. He was thus planning for the functioning of the industry under ideal conditions and, in order that his ideal might be realized, it is evident, said Mr. Suman, that there would have to be revision of some laws.

Wells should be drilled, he said, at points on a geologic structure where oil can be withdrawn most efficiently, that requirement bringing into play the most effective use of reservoir pressure, both gas and the water moving in from below or along the sides of the pool. The early wells, located on the basis of geological or geophysical maps, would serve to define the pool and to give essential data on the characteristics of the producing formation.

From these facts, a well spacing program could be prepared which would accomplish the most thorough recovery of oil at least expense. Property lines should play no part in the final program. (This, of course, could be worked out only by complete unification, or pooling, of both the royalty and the lessees' interests, or by co-operation among all parties concerned.)"

"During the exploration of the pool its limits are defined and the characteristics of the oil bearing formation, and the oil, gas, and water content of the reservoir are determined," said Mr. Suman.

"A compilation of this information reveals the average thickness, porosity, and permeability of the reservoir, and is used to determine the volume of oil and gas under the individual leases covering the pool.

"An improved method has been developed recently by which the relative oil content of the various properties can be determined. This method is superior to the method of allocating values on sand thickness, porosity, permeability, and percentage recovery and may eventually supersede it.

"The new method utilizes information obtained from flow characteristics of the wells. Any time after a well is completed, it is allowed to flow at various rates by changing the choke size, and the bottom hole pressure is carefully measured. The relation between the rate of flow and change in bottom hole pressure gives the engineer a measure of the ability of the formation, in the area surrounding the well, to produce oil. The ability of the formation to produce oil in various places gives an accurate measure of the relative value of various properties.

"THERE are a large number of pools in which exploration will show that certain tracts contain predominantly free gas. Owners of such tracts have a right to the gas itself, but not to the energy contained in the gas. This energy is common property of the owners of the pool. Owners of tracts underlaid by gas are entitled to recover it, but in doing so they must not dissipate the energy of the pool as a whole.

"The determination of the extent of participation in the proceeds from the pool by owners of tracts underlaid by gas offers one of the most difficult problems in establishing principles governing equitable and efficient oil pool development, but it can be satisfactorily solved.

"In order to compensate the owners of the free gas, there are three proposed plans:

"1. That the value of the free gas compared to the oil may be estimated, and the owners of the free gas given an over-riding royalty on the oil produced.

"2. An estimate may be made of the volume of free gas, and this purchased in place by the owners of the oil.

"3. The pool may be operated so that none of the free gas is wasted, and after oil production ceases the free gas owners are left with their gas to dispose of as they see fit. Unless the oil can be produced with only its dissolved gas, this would involve repressuring or the injection of gas into the free gas area. In order to compensate the owners of free gas for the delay in their income, they could be currently paid the equivalent of the interest in the delayed income.

"AFTER the well spacing program has been worked out, and the productivity of the tracts in the pool determined, production of oil should be started on a commercial basis. The problem then becomes one of so utilizing the reservoir energy as to move the maximum quantity of oil to the well, and so control the forces comprising reservoir energy that a minimum volume of oil is left in the sand as the water level rises in the formation and the pressure existing in the sand diminishes.

"Equity is attained by maintaining an even distribution of reservoir pressure over the pool at all times. To accomplish this the wells must be produced with a minimum gas oil ratio in order to produce the least amount of dissolved gas from oil left behind in areas remote from the well.

"Gas-oil ratio is not the only determining factor, as the rate of water encroachment is of prime importance. A uniform rise of the water table in a producing formation, with accompanying maintenance of hydraulic pressure, is an important factor in keeping equitable distribution of reservoir pressure, as

well as preventing underground waste. It is important to maintain for the longest period of time reservoir pressures which approximate the original rock pressures, and which do not decline to a pressure less than that necessary to flow the oil from the well.

"In most pools it is advisable to return to the formation as much of the gas produced with the oil as possible, in order to maintain the proper reservoir pressure. In most cases it is necessary to start the return of gas to the reservoir from the beginning, in order to maintain the desired pressure relationship. However, a close study of the effect of the water-drive should be made in determining the proper time for starting injection. In many pools it is generally recognized that beneficial effect is obtained by returning certain of the lighter fractions contained in the gas, such as casinghead gasoline, butane, propane, etc., to the formation under pressure.

"When an oil pool is developed and produced in accordance with the basic principles outlined above, certain results can be assured.

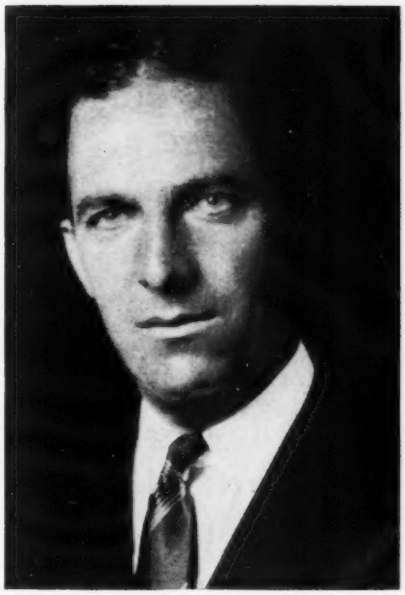
"1. Equitable distribution of reservoir content among the owners in the pool. This follows the principle that the various lease holders are entitled ultimately to an amount of oil equal to that originally underlying their land, although the oil may not be produced through wells located on their land.

"2. Greater ultimate recovery of oil. It is generally agreed among engineers that a much higher recovery per acre will be secured under methods embodying the principles outlined above than under old methods in which dissipation of reservoir energy is rapid and uncontrolled. A recovery figure generlly used for the old pools in the Mid-Continent is 20 per cent of the oil originally contained in the sand. It is believed that operators can easily secure an additional 20 per cent of the oil content of the sand. It is even estimated by some that 50 per cent of the oil contained in the sand will be recovered by the adoption of improved methods.

"3. Reduction in operating expenses. A higher percentage of the recoverable oil can be produced by flowing. The oil which is flowed from a well is produced cheaper than by pumping, gas lifting or other artificial means. Costs are also lowered through elimination of wells, orderly drilling, less maintenance, and avoiding unnecessary lifting of water.

"Operating costs can be reduced under co-operative operations, as well as under strict unitization, as long as the fundamental engineering principles are adhered to. Additional economies can be effected by a combination of operations under one management.

"Kettleman Hills, Calif.; Big Lake, Tex.; Yates Pool, Tex.; Van Pool, Tex.; Sugarland, Tex.; Raccoon Bend, Tex.; and Cook Pool, Tex., are operated in a manner to incorporate many of the principles outlined above. Some of these pools are under one management; and, in others, the individual operators retain complete control of their own operations, and accomplish, in a great degree, the same economies and advantages as under unitized projects. Although none of these operations contains all the good points of the ideal, they represent substantial progress towards the goal for which engineers and all progressive companies are striving."



—Kaiden-Keystone Studio

Edward L. Shea

Duties of Tide Water Oil Executive Enlarged

NEW YORK, Nov. 9.—Edward L. Shea, for 14 years an active member of the Tide Water Oil Co. staff, has been appointed executive vice president in charge of all the company's operations.

Mr. Shea was vice president in charge of sales, but he is particularly fitted for his new and enlarged responsibilities, because of his experience in practically all branches of the business, including producing, refining and sales.

Starting as a salesman for Tide Water, Mr. Shea later spent considerable time at the Bayonne refinery. He then was transferred to the producing fields in Mexico. His first major executive post was vice president in charge of manufacturing.

Recognizes Four Zones At Oklahoma City

By Telegraph

TULSA, Nov. 10.—The Oklahoma Corporation Commission has issued an order re-allocating production allowables of wells in the Oklahoma City field. The new order recognizes four separate producing zones in the field as has been urged in the past.

Four divisions are, Wilcox sand, fault line, lower Simpson and siliceous lime. Wells in the last two are making water and are given larger allowables on the theory that underground waste will be prevented. This is the first time that such action has been taken by a regulating body.

Production from wells not making water was cut from 5.4 to 4.5 per cent of potential. Simpson wells were given 200 barrels per day in excess of their previous allowable. Siliceous lime wells are allowed an extra 250 barrels per day.

Operators of wells in the sand zones are protesting the order since small water wells are placed on a par with wells of big potential.

East Texas Acreage Plan Delayed By Numerous Protests

DALLAS, Nov. 7

ALTHOUGH the general belief last week was that at an early date the East Texas field would be operating under a proration plan based on acreage, uncertainty developed after the hearing held in Austin Nov. 4 by Gov. R. S. Sterling. So many appeared to protest the plan offered by the Texas Oil & Gas Conservation Association a week earlier that it seemed certain a modification of the plan would be made, if it is issued at all. The governor indicated that he was drafting a proposal of his own.

To take care of the 400,000-barrel limit on East Texas production the governor reduced the allowable again, making it 125 barrels per well daily. This became effective at 7 a. m., Nov. 7. Production had climbed, as new wells were completed, and the daily average for the week ended Nov. 4 was 418,500 barrels. There were 2799 producing wells as of that date. On the basis of 2800 wells, the present allowable is 350,000 barrels and it will require 400 more wells to bring it to the 400,000-barrel figure. In less than a month, the allowable will have to be reduced again, unless some other plan is adopted.

Those who protested numbered about 75 and the group was made up of small operators and royalty owners. They said they were satisfied with the way the district is now being handled by the governor and favored the continuance of the well-allowable basis of proration. They denied that more than a slight reduction in drilling would be achieved, which is the strongest argument used by proponents of the plan. They predicted also that suits would be filed if the acreage plan were ordered.

For the present, therefore, it looks as though the field will go along for a while under the well basis, with military forces handling the matter. The Railroad Commission has relinquished all authority. A. B. Capers, the commission's umpire, was released and was immediately commissioned a captain in the National Guard. He will serve as assistant to Gen. Jacob F. Wolters. The commission has a number of employes still in the field, but their duties are confined to the gathering of information and the general has made it known that they have no authority to interfere either with drilling or proration.

The movement of oil from the district during the week ended Nov. 4 averaged 446,500 barrels per day, resulting in drafts on storage of 28,000 barrels daily. Tank car shipments averaged 4450 barrels; main pipelines, 423,720 barrels and local refineries get 18,330 barrels, which latter item was a decrease of 5700 barrels from the average of the previous week.

Union Extends Interest In Kettleman Hills

LOS ANGELES, Nov. 6.—Extension of its holdings in the north dome of the Kettleman Hills oil field was made by Union Oil Co. the past week through purchase of an undivided half interest in two parcels of land held by Belmont Investment Co. headed by Carl H. Beal, independent lease operator. The deal is similar to the one closed over a year ago in which Union obtained half interest in acreage held by Amerada Petroleum Co. on the northwest end of the Kettleman structure.

In this latest transaction, Union will take over 640 acres, including the E½ E½ W½ of Sec. 24, 21-16 and the SW¼ of Sec. 32, 21-17, all on the north dome. Some 340 acres of the land is within the line of participating acreage of the Kettleman North Dome Association, so that Union is entitled to a definite percentage of the Association's total production. This makes the company an indirect member of the Association, a body that it has not as yet joined. The remainder of the land, while considered favorably located, is outside the "blue" line designating the supposed limits of production.

Two Men Plead Guilty To Tax Evasion

CHICAGO, Nov. 9.—Poole Harrison and John F. Connor, two of the 13 men recently indicted on charges of evading gasoline taxes, pleaded guilty in the Cook County Criminal court today. Sentence was deferred, at the state's request, until after the other 11 men are tried. The two will be state witnesses at the trial of the others probably late this month.

Harrison last week gave the state's attorney a signed statement implicating Louis Weiss, one of the defendants and former investigator for the state gasoline tax bureau, in bribery. He said he had given Weiss more than $17,000 in a 50-50 split of evaded taxes.

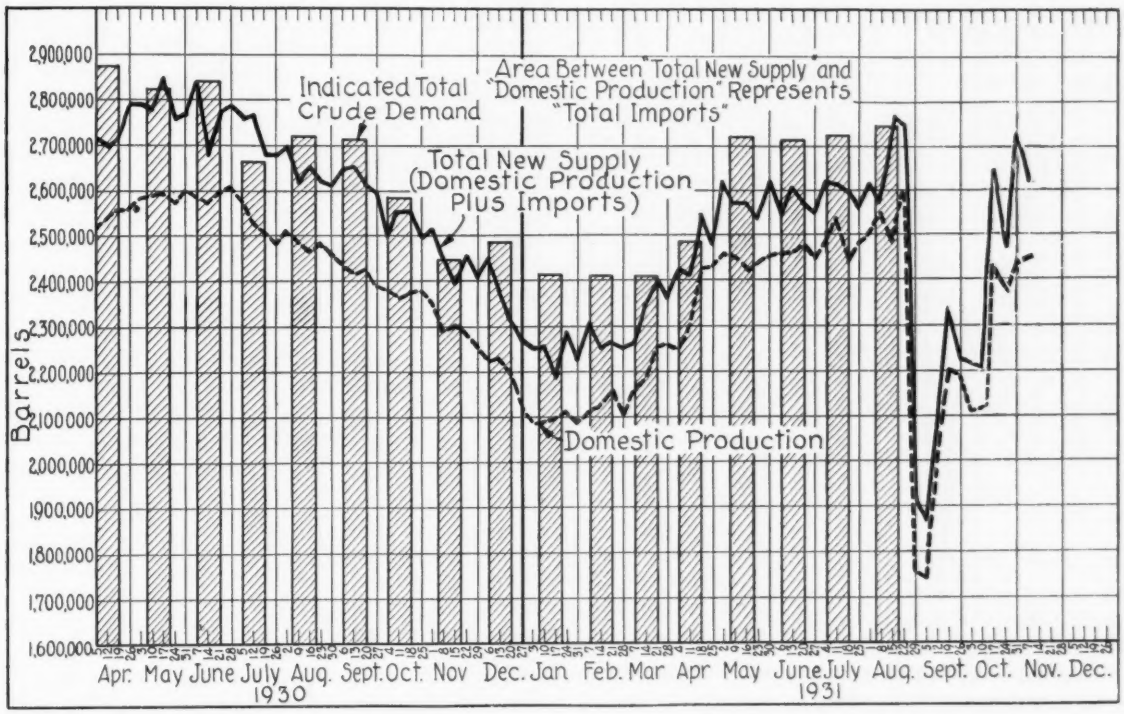
Wagner Heads West Coast Geologists Group

LOS ANGELES, Nov. 7.—C. M. Wagner, General Petroleum Corp., was elected president of the Pacific coast section of the American Association of Petroleum Geologists, in convention here Nov. 5 and 6.

H. L. Driver, Standard Oil Co., was elected secretary-treasurer. Retiring officials are M. G. Edwards, Shell Oil Co., and L. N. Waterfall, Union Oil Co.

Geological discussion of conditions governing possible commercial oil production in the San Joaquin valley and Coastal areas of the Pacific coast featured the 12 papers presented at the convention.

Review of Late Production News



This chart shows crude oil supply according to the American Petroleum Institute reports (solid line) in relation to indicated crude oil demand as taken from the Bureau of Mines monthly reports (shaded columns).

DOMESTIC crude production increased 25,550 barrels daily average to 2,431,250 barrels in the week ended Nov. 7 according to estimates of the American Petroleum Institute.

Imports dropped 127,144 barrels daily average to 156,571 barrels per day bringing total new supply down 101,594 barrels to 2,613,371 barrels per day.

Oklahoma production increased 15,800 barrels daily average and Texas production was up 10,600 barrels during the week.

Oklahoma

OKLAHOMA fields were characterized by the same dullness that has prevailed for many weeks. No wildcats show promise of developing new sources of production and most of those that are considerable distances from production are shut down. While there is more talk of drilling deals since the price advance, little action seems imminent.

Drilling operations in Oklahoma Nov. 1 totaled only 296 as compared with 703 a year ago. Projects shut down totaled 135. Oklahoma City had 70 operations as compared with 226 a year ago.

Kansas

IN that area commonly known as Western Kansas, but which is really the central part of the state, there is considerable stirring about which indicates that some drilling may soon be in progress. A zone roughly 40 miles long, north to south, has been proved for production by isolated wells which had initial productions varying from 750 to 3000 barrels, in the Siliceous lime. It will not be continuous production over this distance, but a series of pools of varying sizes.

Much work has been done by several operators who own leases in the region to obtain agreement to space wells one to reach 40 acres so as to reduce development costs and keep production from building up to a high peak. The Public Service Commission of Kansas has issued an order that wells shall be so spaced, but the matter is not finally determined.

A failure in this area was completed during the week when Hinkle and Palmer's No. 1 Phelan got a hole full of water in the Siliceous. This test, in the SE corner of 2-17-10W, topped the Siliceous at 3309 feet and filled up 200 feet with oil from 3318-20 feet. Drilling was continued to 3344. Water appeared at 3338 feet and no increase in the oil showing was had after the two feet of saturation had been passed.

The well is near the small town of Holyrood and is roughly three-fourths of a mile west of the well of Allshouse, Aylward and others, which was brought in last April. The latter well was given a swabbing test the past week and averaged 109

Daily Average Production, Important Districts, American Petroleum Institute Figures

(By Telegraph)

	Week Ended Nov. 7 Barrels	Oct. 31 Barrels
Okla. City	189,150	184,750
Oklahoma	534,850	519,050
East Texas	419,450	417,700
Total Texas	1,004,350	993,700
California	496,100	496,900
East of Rockies	1,960,700	1,934,350
Total U. S.	2,456,800	2,431,250

barrels per hour for seven hours.

West Texas

A SHOWING in Ward county, the next county south of Winkler, in the West Texas Permian basin, attracted interest to the test of Shipley and others No. 1 Moore, in Sec. 3, Block 1, W. & N.W. Survey. It is just northwest of the town of Barstow.

Top of a pay formation was found at 4663 feet and enough oil to fill the hole 100 feet in 2½ hours was encountered at 4664-65. Only a small amount of gas accompanied the oil. At the end of the week the well was shut down while preparations were being made to test this showing.

East Texas

IN East Texas the test of Cranfill-Reynolds Co. in Upshur county holds chief interest in the wildcatting around the present defined area. It is No. 1 Milton Rash, in the E. N. Eubanks Survey.

Although dry holes have been drilled between it and the north end of the field, the test is finding formations so much higher than did those critical dry holes that it is being watched closely. It topped the Pecan Gap chalk at 2089 feet sub-sea level, which is 136 feet higher than the same formation was found in the Holloway & Sowden No. 1 J. R. Penn, in the J. Manning Survey, four miles west and a mile south of the Cranfill-Reynolds well.

The Penn well, which excited considerable interest several weeks ago because it was running higher than was expected, was a failure. The Cranfill-Reynolds test seems to line up about 150 feet higher than the DeArmand dry hole, three miles south and a little west. If the Cranfill-Reynolds test lives up to its early promise, it would add considerable acreage to the producing area of East Texas. At the end of the week it was shut down at 2547 feet in the chalk, awaiting the replacement of fuel tanks which were burned early in the week.

Mississippi

THE wildcat of the Gulf Production Co., in 10-2N-16E, Clarke county, Miss., which caused a considerable flurry two weeks ago, has been tested in the formation where oil showing was had. The result was a small amount of 14° gravity oil and considerable water. It is a failure at its present level, which is in the Eutaw, corresponding closely to the Blossom sand. The Blossom is productive in Louisiana and Arkansas. The company will drill to the Tuscaloosa formation, which correlates with the Woodbine series, productive in East Texas and certain pools of Louisiana.

California

IN CALIFORNIA the outstanding development of the week was the completion of a Kettleman Hills, north dome, well for an initial production estimated at 30,000 barrels per day. The well, Kenda's No. 4-28J, Sec. 28, 21-17 boosts total daily actual production from the field to nearly 90,000 barrels and gives the area a potential of approximately 215,000 barrels.

On the Kettleman Hills middle dome, Petroleum Securities is drilling below 8970 feet in dark sandy shale in its Burbank 1, a test of the Temblor formation in the area. Offsetting this test on an adjoining section, Standard of California is below 6000 feet in another deep test. So far, field reports have not been favorable to commercial production from the Petroleum Securities project. Although showings in the upper Temblor were reported giving ether cuts more recent cores had an unfavorable reaction.

Preparations to do a considerable amount of wildcatting in the San Joaquin Valley and Coastal regions have been announced by several California companies. This work, which is expected to be started early next year will test oil and gas possibilities in the neighborhood of Wheeler Ridge, lower San Joaquin Valley; Devil's Den, south of the Kettleman Hills; and Lompoc in Santa Barbara county.

Continental Oil Co.'s deep test in the San Miguelito field, midway between the proven areas of Ventura Avenue and Rincon in the Coastal region has obtained a successful water shutoff at 6472 feet and is standing with a cement plug to 6482 feet.

Commission Issues Well Spacing Order in Central Kansas

TULSA, Nov. 7

THE opening of isolated producing wells in the Rice-Ellsworth county area of central Kansas, shut in for lack of market for months, and the issuance of an order on drilling have drawn fresh interest to this district.

The order, issued by the Public Service Commission of Kansas, is in line with the efforts that several operators have been making to prevent the development of the area on a hurry-up basis. Dated Nov. 3, the order directs that no wells shall be drilled in the Siliceous lime producing area of Ellsworth, Rice, Barton and Stafford counties, except on the basis of one to 40 acres. It is temporary in nature and a hearing will be held on Dec. 10 at Lyons, Kans., to decide whether to make it a permanent order.

Many doubt the authority of the commission to determine the spacing of wells, as such authority is not expressly given it in the Kansas conservation law.

One of the wells in the area which is making a good showing for itself is the Midwest Exploration Co.'s producer in the SE corner of 36-22S-12W, Stafford county. It was completed Jan. 7, 1931, and after producing 1200 barrels in 24 hours, it was shut in. Its pay is in the Siliceous lime, 3541-99 feet. It has recently been opened and has averaged on the pump more than 1300 barrels per day. The oil is being handled by the Stanolind Crude Oil Purchasing Co. from loading rack.

A block of more than 1400 acres around the well has been unitized and no drilling campaign is expected, as this unit takes in not only the working interest but royalty and under the plan property lines have disappeared, so far as oil production is concerned.

The Doing of a Few Simple Things Will Stabilize Our Industry

By E. B. Reeser*

(President's Annual Address, Presented before American Petroleum Institute, Chicago, Nov. 10-12)

IN MY remarks a year ago I said: "The entire world is in the throes of an economic upheaval. The depression is confined to no one country, nor to one single industry."

Many predictions have been made since that time that "the corner has been turned" and that business henceforth would show constant improvement. Needless to say, few, if any, of these predictions have materialized.

It is not within my sphere to speculate on the cause of the depression, nor to guess the time when normalcy again will prevail. Volumes have been written on the subject, and even the stars have been searched for statistical data; so that he who reads may find exactly the reasons and arguments he desires, and even may select the exact date upon which the corner was, or will be, turned. One fact, however, has definitely been established. We no longer can live within ourselves, either as nations, as industries, or as individuals. Despite our much vaunted self-sufficiency, we are forced to admit we are cousins under the crash. Economic inter-dependence is certain and absolute.

Perhaps it is recognition of that fact that has focussed so much attention upon the desirability of stabilizing industrial operations, of smoothing out the peaks and hollows that mark booms and depressions on the economic graph. More and more the idea of independence is being pushed into the background. Fewer and fewer are becoming those who profess to enjoy the liberty of normal times, boastfully quaff the heady wine of abnormal prosperity, and proclaim themselves ready to take their chances on being able to survive the ensuing slumps. Gradually we are coming to admit that some program for the control of production must be adopted.

The current depression has produced a plethora of such programs. They differ in detail, but all contemplate the stabilizing or rationalizing of industrial operations to the end that such slumps as that which causes our present headache may in the future be only memories. One of the most widely discussed of these schemes, due perhaps to its essential soundness and the prominence of its sponsor, is that suggested by Gerard Swope, president of the General Electric Co. * * *

It is not my purpose to pass judgment upon the Swope plan. I wish merely to outline what a typically conservative scheme for the stabilizing of business has to offer, and to point out that, in effect, the Swope plan already is to a large degree guiding the petroleum industry. The trade association is the American Petroleum Institute. For obvious reasons, it has made no effort to control production beyond lending support to the approved policies of proration and unitization, and making recommendations and suggestions for improvement of distressful refining and marketing situations.

Stabilization of prices is outside the institute's scope. Remarkable success has attended its efforts to outline trade practices, business ethics, and methods of standard accounting. Information on the volume of business and other pertinent data have been collected and disseminated. Standardization has been one of the organization's greatest achievements. As a clearing house for ideas, it has been wonderfully efficient.

Without any change in existing laws, and quite without law violation, the institute has been able to do for the petroleum industry much that the Swope plan holds to be essential. Here is the agency, then, organized and ready; what further use will be made of it rests with the industry.

THE fact that the petroleum industry, already possessing the instrumentality for stabilization, never has achieved any high degree of stabilization, and the equally obvious fact that it has been affected seriously by a business depression it might have experienced only as a spectator, are due less to failure of the instrumentality than to the inherent weakness of any program of control regardless how sound. Under existing law, and in the face of forced competitive conditions, well laid plans and soundly economic programs are at the mercy of the individual.

In the final analysis, a few untoward factors and a few uncompromising individuals wield an influence so powerful as to deflect group action from its plotted course to the discomfiture of the majority, and without great benefit to the minority.

Take the case of the petroleum history in the past year. Domestic consumption of petroleum products has continued, in the face of a slump in general buying, to exceed that of previous years. This was a blessing conferred upon few, if any,

*President of Barnsdall Corp. and American Petroleum Institute.

other industries. Despite a decline in sales of new automobiles in the United States since 1929, there has been an increase in the consumption of gasoline, the industry's principal money product. A rapidly growing mileage of improved highways has permitted the same number of vehicles to cover greater distances throughout the entire year.

THERE has been a gain in consumption of gasoline by internal combustion motors employed in other fields. Best of all, this increase has demonstrated that the public, regardless of economic conditions, insists upon possessing and operating its motor vehicles; and is convinced that nothing else it can purchase will give so much satisfaction and so great a return upon the expenditure as petroleum products. I think it is entirely safe to assume that the future of our industry, sofar as it depends upon the maintenance of demand, is assured.

But the best assurance of continued demand may come to naught, insofar as the making of profit, the primary reason for the existence of any industry, is concerned. Profits are weighed in the balance between supply and demand, and any unsettlement of that balance upsets profits. Despite the gain in demand, petroleum products have been selling at the lowest price levels in years. More gasoline has been sold, but at prices about one-third those of 10 years ago.

More crude oil was produced, and more refined products were manufactured during this year, than was justified by sound business judgment. The occupation of two large producing areas by military forces was helpful in reducing production and causing substantial withdrawal from the excessive stocks with which the industry is burdened. Perhaps the resort to the military indicates that state governments have been aroused to the cost, waste, and folly of overproduction of natural resources. At the same time it represented an interference in business by government that has established a precedent.

No regiments mounted guard at refinery gates; and refiners in the aggregate have disregarded the economic charts prepared for them by the committees of the Federal Oil Conservation Board and the institute, and have not curtailed their operations in accordance with statistical data. A better than normal summer market was despoiled by competitive skirmishes which delighted a public always interested in "price wars." Retail prices were pushed below the level of costs.

The situation was aggravated by the wholesale competition of racketeers and gasoline tax evaders, who were keen enough business men to see that there was more money in taxes than in legitimate profits, if any, and prospered accordingly. Fundamentally these difficulties are an outcome of failure, lack of willingness or definite refusal to support attempts to balance supply and demand.

We have heard a great deal recently, especially from bankers and economists, concerning the "unalterable law of supply and demand" and the utter futility of trying to amend it. The president of the New York Stock Exchange recently stated:

"The law of supply and demand cannot be disregarded, and it may not be tampered with. It remains for us to heed the principle of supply and demand, to govern our actions in accordance with its dictates, and thereby to hasten the restoration of prosperity based on the sound and lasting foundation of natural law.

"Everyone must pull his own weight in the boat. There should be no favored classes or privileged industries. Human power and human vanity may tamper with, but can never circumvent its operation. Being a principle of life itself, it is stronger than any business policy ever formulated. It will have its own way, and take its own course. Those who obey it will be rewarded. Those who in folly oppose it will be miserably crushed."

Inasmuch as hundreds of thousands of our citizens are stockholders in the many oil companies whose stocks are listed on the New York Stock Exchange, it seems proper that an effort be made to correct any impression that the petroleum industry, in its attempts to achieve stability, is seeking either to alter, tamper with, or violate this economic law. If the author of the statement just read had this industry's proration policies in mind, let me explain that proration represents earnest endeavor to observe rather than violate, that statute; to enforce, rather than to tamper, with it; and to supplement, rather than to supplant it. Proration, in its essentials, is a method of balancing the supply of material with a demand for it.

Restriction schemes failed in the cases of coffee, rubber wheat, and other commodities because they were outright efforts to peg prices. I submit there is no analogy between those cases and that of petroleum. We are dealing here with an irreplaceable, rather than a crop, product.

WE are interested as much in preventing unnecessary physical waste as in stopping financial losses. We have at heart the future welfare of a nation dependent upon petroleum not merely the present success of an industry. We are seeking not to elevate and peg prices at high levels, but to avoid both those that are artificially high and those that are artificially low. We are asking that petroleum products bring, in the market at least, a price sufficient to pay the cost of production and consistent with their actual value; that the industry's workers obtain rewards worthy of their hire; and that this country be assured of as plentiful a supply of oil tomorrow as today.

I contend that, in the case of petroleum, proper balancing of supply and demand, and complete observance of the laws governing both, make equitable proration of production between the various fields and states not only desirable and possible, but an absolute necessity.

Let me go somewhat into detail concerning conditions which I believe justify this contention, remembering that what may be said regarding production of crude oil in the field applies with few variations to operations in the refinery and in the market.

Since the Drake well was completed in 1859, more than 800,000 wells have been drilled in this country. Of these, approximately 470,000 permanently have been abandoned. Of the roundly 330,000 producing oil wells left, 250,000 have an output of less than 5 barrels each per day. There are perhaps 50,000 additional wells which produce between 5 and 10 barrels each daily, leaving some 30,000 prolific new wells to supply the bulk of a growing demand.

We drill on an average 24,195 wells annually, at a cost of around $600,000,000, not including the expenditures for leases, pipe lines, equipment, storage facilities, etc. Some 2,400 of these are gas wells, and 6,500 are dry holes productive of nothing but expense. Many of these new wells have large initial production, but, on the average, within 18 months they fall into the 10 barrel per day class.

Production from newly drilled wells, with large initial output flowing freely, naturally costs far less than that from the older and smaller wells, which must be encouraged at some expense to yield their oil. Thus, in 1930, the initial production was approximately 10,000,000 barrels, or about 855 barrels per well per day, a new high record. Any policy which permits such an unrestrained flow from large new wells unquestionably tends to depress prices to levels which force the abandonment of the smaller wells.

IT IS unreasonable to expect that the phenomenal success we have had in the past few years in finding and developing enormous prolific new producing areas can continue indefinitely. Each year we write off the book of known petroleum resources just so many more areas which either have yielded their supply of oil or proved themselves barren. The producing acreage definitely is limited, and, unlike that supplying crop products, cannot be increased. It is only a matter of time until the small wells will be needed to aid in meeting demand. Yet we are jeopardizing not only the productivity of these small wells by forcing their abandonment through cheap production from flush wells, but also the tremendous oil reserves which some time may be required for the preservation of the nation itself.

If the same interests owned relatively the same proportion of large and small wells, production from large wells voluntarily could be curtailed to a point which would insure the productive life of the equally important smaller producers. But our system of ownership admits of no such plan, just as our system of leasing permits of no delay in development of new areas.

Each new oil field brings into the industry a group of producers not previously engaged in the oil business, and not at all concerned about the conservation or protection of the older areas. Their interest selfishly is centered in the profit possibilities of the moment. Opportunists, they flow their wells recklessly to the limit, disrupting the markets and destroying the business and the property of others. They ride the crest until their wave of good fortune breaks and ebbs, then desert the wreckage their greed has left. Should any demand details, I refer him to the history of the East Texas oil field, the most conspicuous and recent example of the ruthless destruction of an entire industry's welfare, without regard to anything other than a temporary benefit to an unscrupulous promoter.

I submit that in the case of petroleum the "unalterable law of supply and demand," if subjected to no wise and prescient interpretation, degenerates into the jungle law of the "survival of the fittest." Permit that currently to happen—and Kettleman Hills, Oklahoma City, East Texas, and a few other oil producing areas, with their less than 5,000 wells, will supply the entire demand for crude oil in this country. Transportation differentials might make possible the operation of a few other wells in favorable locations, but, generally speaking, the complete abandonment of small wells would result. Thousands of men would be rendered idle, and the physical and economic waste would be enormous.

But interpret the law of supply and demand in the light of a statute calling primarily for the balancing of these two factors rather than their unrestricted individual development, and you provide for the continuance in operation of the necessary and invaluable smaller wells by proper proration of flow from the larger producers. It is not a matter of striving to justify the existence and operation of uneconomic sources of oil, but of safeguarding the future supply of an essential, irreplaceable, commodity. It is not a matter of supporting the weak at the expense of the strong, or coddling the small to the annoyance of the large, but of conserving assets, small as well as large, threatened by destruction.

IT IS my opinion that it is to the best interests of the consumer as well as of the producer, indeed, of the nation itself, that small wells be permitted to produce to their maximum capacity, and that the price of crude oil be sufficient to cover their operating costs. I believe that the economics committees of the Federal Oil Conservation Board and of the institute should continue to furnish comparable figures showing their ideas of the proper amount of oil that should be produced annually, and that the difference between the output of small wells and the total amount required should be taken from the larger flush wells under an equitable proration policy.

Recent decisions of the regulatory bodies of the states of Kansas, Oklahoma, and Texas indicate that they recognize that theory as sound, and on that basis they will enforce proration in their several areas. In fact, the governments of the chief oil producing states appear to have come to a full realization that this great natural resource must be produced and consumed in a manner that avoids waste, meets demand, and insures both industry and states of reasonable prosperity.

The action of these bodies is sufficient evidence that the economic, rather than the jungle, interpretation of the law of supply and demand has won the approval of constituted conservation authorities. For the

first time in history these bodies have joined in a program which contemplates limitation of oil production to recommended amounts for the latter portion of 1931 and for all of 1932.

Court decisions have tended to uphold the theory of equitable rights in particular oil producing areas and the authority of state government to use their police powers to enforce reasonable regulations upon production. It would seem that such laws in the future will be strengthened rather than weakened.

Already the 19 oil producing states have conservation laws and regulations relating to production of crude oil. Fifteen seek to control drilling by law, and fifteen have statutes covering waste. Nine states seek by law to prevent production in excess of market demand. Nine have laws providing for proration or proportional production. Ratable taking from competing fields is regulated in the laws of three commonwealths. Three also have laws covering unit, or cooperative, development of oil fields and cooperative agreements.

IN 1924 President Coolidge recognized the wastefulness of enforced competition in the petroleum industry. He created the Federal Oil Conservation Board with the specific hope of reducing that waste. The industry has attempted to put into effect the recommendations of the board, and within the past few years active efforts have been made to correct many evils. Real progress was made in 1931, perhaps greater progress toward stabilization of the industry than in any previous period.

Admittedly, less progress has been made than is possible because of the seemingly insurmountable barrier to necessary cooperation and agreement raised by the anti-trust laws. It is not my thought, even were it necessary, to condemn these statutes. They may have served well the purpose for which they were framed; but the fact remains that statutes, like everything else, suffer obsolescence. These particular statutes today are targets and objects of oratorical abuse, as well as a plausible excuse for the failure of many seemingly sound plans for improving business.

The anti-trust laws, something of a handicap in solving our production problems, admittedly are a definite, discernible barrier to any great progress in stabilizing the operations of our refining branch. Still, they cannot be construed as prohibiting individual and voluntary action. They are decidedly a thin alibi for the failure of refiners separately and independently to follow the proved and approved operating charts prepared periodically for them by committees of the Federal Oil Conservation Board and the institute. These two committees, working independently, have supplied the industry in general and refiners in particular with forecasts of expected demand and estimates of necessary supply. So remarkably accurate have these been, that they may be accepted henceforth as positive statements of what will happen during the succeeding period.

It is regrettable, to say the least, that the refining branch has not given them due attention. Some executives apparently have left the control of refining operations to manufacturing and sales departments. Volume and unit cost, rather than demand and cost of production, seem to be the influential factors. The ease with which continued distressing conditions in the refining branch could be avoided makes their sufferance the more ridiculous.

OUR marketing situation, insofar as ethics is concerned, has shown improvement. Much good has come from efforts to devise better and fairer methods of distribution through work with the *National Code of Practices for Marketing Refined Petroleum Products*. Never was it expected that the code would fix prices, that it would be perfect, or that it would achieve all its objectives at once. But a great deal that is beneficial has been accomplished, and the members of the many code committees are entitled to a vote of thanks for the time and ability they have devoted to code work.

There is some evidence that fewer than usual new retail outlets were opened during the year, and that more than usual were closed. Such a conclusion, however, still lies in the realm of guess work. A recent report of the United States Bureau of the Census indicated that in 1930 there were 178,949 outlets specifically retailing automotive fuels and lubricants. The same report disclosed this total could be raised to 210,826 by including outlets selling these products as side lines. These figures are considerably below the count of 317,000 retail outlets reported in 1927 by an auditing firm, and there are many who will question their accuracy. Meanwhile, consensus of opinion is that, regardless of the exact number, there are too many and that no more are needed.

MORE serious at the moment, perhaps, than the problem of duplication of marketing facilities is the situation growing out of gasoline taxation and resulting tax evasion. Reliable estimates place the total of such taxation this year at around $500,000,000, and total tax evasion at 3 to 10 per cent of that amount. Certain evaded taxes run into millions of dollars, representing a great financial loss to the states, a reduction in the business and profits of this industry, and an imposition upon reputable gasoline marketers.

The losses, in a larger sense, are reflected in curtailed road-building programs for lack of funds, and a consequent demand for increased tax rates to recoup the deficits. The cumulative result is to place a larger premium upon violation of the tax laws, to encourage gasoline bootlegging and tax evasion, and to add to the unfair burdens of tax collection and unethical competition with which this industry's marketers are laden.

State gasoline taxes range in rate from 2 cents to 7 cents per gallon. The average tax per gallon is slightly more than 4 cents, or about 33 1/3 per cent of the average retail price of the commodity taxed. In some lo-

calities state, county, and community gasoline taxes are pyramided to the point where the total tax is more than the price of the fuel itself.

The growth of gasoline taxation has been hidden by the continued and extreme reduction in gasoline prices. The tax, therefore, fails to pain the taxed as much as otherwise it might. But the consumer is beginning to realize that rising taxes and increasing tax evasion are creating an intolerable situation, and the marketer is winning consumer support and good will for efforts to improve conditions that are as unfair to seller as to buyer. Since the gasoline tax must be viewed by this industry as a definite and sizable handicap to any recovery in gasoline prices, that good will may be cherished as a precious asset. Sight should not be lost of the facts that economy is the order of the day; that oil and asphaltic road surfacings meet not only the requirements of economy, but the needs of most of our highway mileage; and that the problem of gasoline taxation might possibly be solved by reducing rates to the lowest common denominator and employing revenue derived in building greater mileage of really economical roads.

I have tried in these words to present to you a picture of our industry and the necessity for its stabilization. Let me say something about the means to that end. There are many obstacles, laws, traditions, inertial difference of opinion and the like; but the experiences of other industries indicate that the desired end may be reached by doing comparatively simple things.

The first is collective curtailment of production, or the adjustment of supply to demand.

The second is orderly liquidation of excess stocks.

The third is reduction of costs.

The fourth is development of uses and markets.

But regardless how simple the method, it is necessary to take action. Calvin Coolidge put the matter exactly when he said recently:

"If all the folks in the United States would do the few simple things they know they ought to do, most of our big problems would take care of themselves."

Industry Has Plenty of Leaders But Needs More Followers

CHICAGO

ALL the leadership necessary to right conditions in the refining branch of the industry exists already in each company, W. R. Boyd, Jr., acting chairman of the refining division of the American Petroleum Institute, said in his annual report.

"In a sense we, in the petroleum industry, are absurdly demoralized," he said. "Our business nerves are raw and frayed. Our business vitality is low. We say irresponsible things; we commit foolish deeds. We cry aloud for 'leadership' when already there is a surfeit of it. When we need most right now are followers.

"There is no magic way to restore prosperity in the oil business. No leader selected for the industry can make or enforce policies for any individual unit. But there is a commonsense method for finding the way back to prosperity, viz., for the management of each company refining oil in the United States to adapt its operations to the recommendations contained in the reports of the committees on economics of the Institute and of the Federal Oil Conservation Board.

"Such action would instantly improve conditions if, indeed, it would not actually put the refining branch of the industry on a profitable basis in a surprisingly short time.

"The statistical position of the industry has improved to some extent. Admittedly, good work has been done. Some reduction in gasoline stocks has been made; and some refining units, be it said to their eternal credit, have done as much as, or more than, their share. Nevertheless, it is plainly and, if I may say it, painfully evident that some units of the industry have paid little serious heed to the remarkably accurate forecasts of conditions.

"The result of weeks of intensive study, and of the experience and best judgment of groups of competent men of the industry, has gone into these reports. The generous expenditure of time, money, and effort of these men, made with the sole motive of aiding the industry in general, deserves more attention and greater support than it has been receiving.

Economic Factors Govern Conditions

"Believe it or not, economic factors that are just as plain as the nose on one's face are governing conditions in the petroleum industry. Unless managing executives of all refining units, whether operating independently or as part of an integrated company, keep informed and revise production operations so as to adjust, and keep adjusted, the delicate balance between the industry's supply of products and the current demand therefor, conditions cannot improve materially; there can be nothing more than a struggle on the part of each refining unit to survive until enough of the companies now failing or refusing to met the problem intelligently go into bankruptcy and pass out of the picture.

"The problems of the industry require solution by the industry. Representative groups within the industry must study the problems, and recommend solutions; but nothing can be accomplished, finally, without the independent acceptance of these recommendations by individual units.

"If any semblance of orderly progress in the restoration of prosperity for the refining branch of the petroleum industry is to be achieved, it must, and will, come through the serious individual support of those sound industrial programs developed by group action.

"In the very nature of our competitive enterprise, it cannot be done unless every refiner watches for, and heeds, the danger-signals as they are giv-

en. For some to continue to beat the tom-toms of dissension is only to prolong the industry's agony, and to make themselves and their industry appear ridiculous."

Mr. Boyd reported that individual membership in the refining division had grown from 379 to 506 in the past year. He reviewed the activity of the various standing committees, pointing particularly to the completion of the manual on fire protection and Section 2 of the manual on disposal of refinery wastes.

Seubert Calls Industry to Joint Fight Against Tax Evasion

CHICAGO, Nov. 11

A CALL to our industry for united effort to end gasoline tax evasion was made before the marketing division of the American Petroleum Institute by Edward G. Seubert, its chairman and president of the Standard Oil Co. of Indiana.

As one means of discouraging the entrance of tax evaders into the business of marketing petroleum products, Mr. Seubert recommended that the institute should use its persuasion against increases in tax rates. Taxes also threaten to go beyond the point where they might begin to deter consumption of gasoline. He did not suggest a uniform tax rate but indicated he believed there was a point which could be determined, beyond which the law of diminishing return would become operative.

Our industry is getting on firm ground statistically, Mr. Seubert pointed out, but the good of the industry as a whole and also of its component parts is being sacrificed by a greed for gallonage.

"While much is being done toward cutting down production," he said, "little or nothing is being done to stimulate the demand by creating new and additional consumption. Greed for additional business means, therefore, greed for business that somebody else already has.

"Numerous ways of obtaining somebody else's business have been devised and tried, but the favorite has been and probably always will be, price cutting. The producer reduces his price below the posted schedule to get an outlet for a few more barrels than he might otherwise sell; the refiner yields to an offer of a lower, and perhaps entirely unprofitable, price to keep his stills going; the marketer cuts prices to attract the patronage of motorists who have been going to his competitor's station across the street.

"The immediate and logical result of price cutting is more price cutting. The competitor whose business is attacked by a price cut is forced to meet the price or lose business. Such struggles rarely remained localized. Originating independently at various points, they spread rapidly in all directions, until now the whole industry is involved. We have seen the process repeated often in the last two years.

"Disastrous, as it obviously is to the whole industry, including the very members of the industry with which such price cutting waves originate, no single unit or group has proved powerful enough to stop the spread of the contagion. It stops only when the excesses to which it leads have hurt all participants sufficiently to cause a return to a more sober and sensible line of reasoning.

"We have discovered that a sound statistical position is of itself not sufficient to assure sound marketing of petroleum at any of the stages of its progress toward consumption, so long as any marketer has available more oil or oil products than he can readily sell. The individual who resorts to price cutting, to dispose of a little more of his product, exercises an influence wholly out of proportion to his importance in the industry, because of the speed and generality with which his example is usually followed by those in competition with him and, in turn, by others to whom their influence reaches."

The net result of price cutting in the oil industry has been the same as in every other industry, Mr. Seubert asserted; the other fellow has invariably met the lower prices and the seller has lost his profits without gaining any advantage.

Concerning the effect of tax evaders on price structures, Mr. Seubert said:

"The tax evader can cut his price by the amount of the tax, and still make as much money as the marketer who pays the tax. He can cut it by part of the tax, and make more than the legitimate marketer. He can cut it more than the amount of tax, and still make some money when the legitimate marketer is suffering a loss.

"With competitive conditions what they are, with the tendency strong on the part of all rival marketers to meet the price reductions announced by competitors, it is easy to see that a single tax evader, by cutting his prices to obtain business, can cause a reduction of prices by all other marketers in his community. If he cuts repeatedly, he can bring prices down to a level that means ruin for the legitimate marketer; while he can continue to make a profit, increasing as he obtains the business of his competitors.

"Low prices in one community spread rapidly to other communities. A few tax evaders here and there can wreck the price structure of a vast territory in the course of time. For a long time marketers have been meeting prices. And those who watch their accounting closely have been wondering how their competitors could make the reductions they were making.

"The same competitors have doubtless been wondering, in like manner, regarding the competitors whose prices they were meeting. In many of these instances, it is now logical to conclude, on the basis of recent revelations, that the snake in the

grass that has been setting these gentlemen at each other's throats was the tax evader, who had nothing to lose and everything — literally everything— to gain by forcing prices down to the point where they would eliminate his competition. The tax evader is a stone thrown in the mill pond from which waves of price reduction have spread in ever-widening circles."

Mr. Seubert listed eight general methods* of tax evasion and told what the oil industry in the Chicago area had done to curb evasion there. He recommended that the institute should have a permanent committee to deal with evasion on a national basis. Assisting this national committee would be state committees who would arouse the legitimate marketers in their territories. The national committee would work with state committees in getting more uniform and more effective tax laws.

Tax evaders have already become too powerful to be stopped by the unaided efforts of the small band of state tax enforcement officers, he said. State officers deserve the aid of our industry, he added.

Re-approval of the code of marketing practices, he said, had given new life to code work.

*See Frank V. Martinek's "Fourteen Points in Fighting Evaders", NATIONAL PETROLEUM NEWS, Oct. 28, 1931, page 38.

Proposes Meeting to Cut Production

TULSA, Nov. 7.—Thurman Hill, member of the Kansas Public Service Commission, has proposed a tristate conference to be held in Tulsa Nov. 30 to discuss further reductions in the production of Kansas, Oklahoma and Texas. Mr. Hill took the initiative in calling the conference which was held Sept. 11 at Oklahoma City. At that time agreement was reached to allot to Texas 902,000 barrels daily throughout 1932; Oklahoma 546,000 and Kansas 110,000. Subsequently, on Sept. 18, the pact was formally signed by the governors and the public utility bodies of the three states.

Unit Development of Pools Only Permanent Cure

CHICAGO, Oct. 10

UNIT, or pool, development of new oil fields is the only permanent cure for many of the present producing ills of the oil industry, Robert R. Penn, Penn Oil Co., Dallas, vice president for production of the institute and chairman of its division of production, was to say in his annual report to be presented at the Nov. 11 session of that division.

He spoke of the work of the institute's committee on unit operation, under the leadership of W. N. Davis, Phillips Petroleum Co.

"It has continually held before the public this practical ideal of economical pool development and it has caused, through appropriate channels, analysis of the various aspects of the plan," said Mr. Penn's published report.

Referring to the work of the institute committee on drilling and production practice, H. H. Hill, Standard Development Co., chairman, Mr. Penn's report said the greatest stabilizing factor that can be introduced in drilling and producing operations will come about through the universal applications of the recommendations of this group.

"This group, possibly more than any other, has brought home to us a clearer understanding and conception of the special characteristics of crude oil that differentiate it from all other minerals and natural resources through their discussions and publications on the function of natural gas, their studies in relation to air and gas injection, their investigations and recommendations on straight hole drilling practice," his report stated.

Referring to 1931 and its tribulations, the report said:

"We have been seared and scorched and bear terrible scars. Our industry will not willingly again undergo such tortures as we have had in 1931. We have the intelligence, we have the leadership to take the necessary steps to prevent a recurrence of a cataclysm such as we have had this year. The only question is whether we have the united will."

Committee activities of the division were summarized. That on standard procedure for measuring, sampling and testing crude oil, W. S. Farish, Humble Oil & Refining Co., chairman, is ready to consider final adoption of a code prepared for the purpose of establishing uniformity in operations necessary in measuring and evaluating crude oil.

The committee on corrosion of oil field equipment, C. R. Weidner, Prairie Pipe Line Co., Independence, Kans., chairman, is carrying on its extensive experiment in pipeline coatings designed to minimize corrosion. A series of tests is being carried on in various parts of the country. Over $100,000 has been spent so far, co-operating pipeline companies donating a third.

The committee on automotive transportation, R. F. Fike, Mid-Continent Petroleum Corp., Tulsa, chairman, is trying to bring about adoption by the various states of uniform regulations governing the operation of automotive equipment on highways. It also has under consideration preparation of a truck drivers' manual and preparation of recommendations relative to truck chassis standardization.

The committee on disposal of production wastes is preparing a manual on this subject. V. L. Martin, Prairie Oil & Gas Co., Independence, Kans., is chairman.

The committee on fire prevention is also preparing a manual on fire protection in oil fields.

The committee on accident prevention, George F. Prussing, Union Oil Co. of California, chairman, assisted in preparing a manual on cleaning storage

tanks, and is preparing others on rotary drilling, field truck and tractor driving, pumping wells and so on.

The committee on fundamental research, H. H. Hill, of the Standard Development Co., chairman, is supervising the two remaining projects of the institute's fundamental research program of interest to producers. They are: "Origin and Environment of Source Sediments of Petroleum" and "Fundamentals of the Retention of Oil by Sand."

NEW YORK—George E. Kipp, Richfield Oil Co. of California, Los Angeles, has been appointed a member of the American Petroleum Institute's committee on automotive transportation. Mr. Kipp succeeds G. C. Noble, resigned.

Republic Tests New Texas Refinery

TULSA, Nov. 6.—The new refinery of the Republic Oil Refining Co., at Texas City, on the Houston ship channel, has made test runs and will soon be operating at somewhere near its capacity of 6000 barrels daily. The plant has both skimming and cracking units.

This corporation is affiliated with the Big Lake Oil Co., subsidiary of the Plymouth Oil Co. in which the well known Benedum and Trees interests figure largely. The Republic Oil Co. of Coraopolis, Pa., is also of the group in which Republic Oil Refining Co. is a member.

O. D. Robinson, of Pittsburgh, is president of both the Republic companies. He was one time an executive of the old Transcontinental Oil Co. And, acting in concert with these companies is a group of marketing companies which operate in Ohio, Pennsylvania and Virginia, the parent firm of which is the General Oil Sales Corp. These marketing companies will handle the products of the new refinery from ocean terminals at Baltimore and City Point, Va.

The plant will operate on crude oil produced by the Big Lake Oil Co., which has an assured supply in West Texas.

The refinery maintains offices in Houston. D. W. Hovey, formerly with the Waverly Oil Works, Pittsburgh, is vice-president and general manager.

D. W. Hovey

Two New Plants Planned For Canada

TORONTO, Nov. 9.—Major W. A. Beckett of St. John, N. B., is promoting an independent plant in Alberta which will specialize in selling liquefied Turner Valley gas, both in domestic and foreign marketing, according to information received here.

Major Beckett says $1,200,000 is available from eastern capitalists for this purpose and he asks that in addition $300,000 be provided by Alberta independents.

The Simrall Refining Corp. of Canada, Ltd., is about to begin the erection of an oil refinery at Amherstburg, Ont., at a reported outlay of from $150,000 to $200,000 recent reports have stated. The company is a subsidiary of the Simrall Refining Corp. of Cincinnati, O.

Oil Accidents Below All Industry Average

NEW YORK, Nov. 6.—A saving of $1,500,000 in medical expenses and compensation costs has been effected to the oil industry the past year through accident prevention work, according to a report delivered by H. N. Blakeslee, safety engineer of the American Petroleum Institute, at the annual congress of the National Safety Council in Chicago recently. In four years, the industry's accident frequency has been cut 54 per cent, Mr. Blakeslee said.

The average accident experience of the oil industry today is below the average of all industry in the United States, whereas four years ago it was about 20 per cent higher.

During the first six months of 1927, his paper pointed out, one oil worker out of every 32 was injured seriously, while during the first six months of 1931, only one serious injury for every 45 men was recorded.

Trophies for excellence in accident prevention work were presented at the meeting to these companies:

Producing division: Standard Oil Co. of California, first place among larger concerns; Hope Construction Co., Pittsburgh, and General Petroleum Corp. of California, Los Angeles, first places in the second and third groups.

Refining division: Vacuum Oil Co.'s Paulsboro, N. J., plant, major award; Wyoming refinery of Standard Oil Co. (Indiana), first place in the middle group; and the Bayonne, N. J., plant of the Vacuum, led the third group.

Marketing division: Standard Oil Co. (Indiana), St. Louis and Billings, Mont., sales divisions.

Natural gasoline: Standard Oil Co. of California and Midwest Refining Co.

Pipeline: Standard Oil Co. of California and General Petroleum Corp.

Marine division: Union Oil Co. of California.

Zinc Chloride Improves Color Stability, Reduces Gums in Gasoline

by

Arthur Lachman*

(*Presented before American Petroleum Institute, Chicago, Nov. 10-12*)

THE new method about to be described is a vapor-phase operation. Gasoline vapors passed through certain boiling metallic salt solutions. A great variety of such salts may be used, viz., the halides, sulfates, nitrates, or other soluble salts of copper, cadmium, mercury, iron, zinc, etc. For practical and economic reasons, zinc chloride is the particular salt which has been chosen for commercial development.[2]

The zinc chloride method is continuous in operation. The raw vapors pass into the treater in a steady stream, where they meet a continuous flow of solution. The treater may be inserted between the fractioning column and its condensing system for "direct" operation, or the condensed raw gasoline may be re-heated to the vapor condition in a separate unit supplied with its own condenser. Which method is chosen is largely a question of economics; smaller plants, operating one or two distilling units, will find direct operation more profitable.

As the number of such distilling units increases, the cost of a separate re-heating unit and condenser is offset by greater economies in the operation of the treating system itself. There seems to be no practical limit to the size of the treating unit. One such unit is now in commercial operation which handles over 5000 barrels of gasoline per 24 hours.

The Variable

Certain variables are imposed by the operating conditions existing at the plant. The vapors to be treated may have a temperature of 410° F., or as low as 265° F. Fixed gases may be present to the extent of 750 cubic feet per barrel of distillate; or, if the treatment is to be a re-run, they may be absent. Most plants have their condensing system hooked up to gas mains, in which the back pressure may vary from a little below atmospheric to as high as 40 pounds per square inch gage pressure. Some back pressure is also due to the passage of the vapors through the zinc chloride solution, as well as to line friction. In some cracking plants, steam in varying proportions is used to assist dephlegmation in the fractionating towers.

The variables which the treating system itself may adjust are:

1. *Temperature.* Normally, the treating temperature ranges between 302° F. and 347°F., although both higher or lower temperatures may occasionally be advisable. If the vapors to be treated are too low in their initial temperature, heat must be supplied in some manner; most easily, as a rule, by means of super-heated steam.

2. *The concentration of the zinc-chloride solution.* This varies from 70 to 85 per cent (by weight) according to the stock being treated. The adjustment of this concentration is not difficult, but requires some calculation. As the concentration is to remain reasonably constant, we are dealing with the system, zinc-chloride solution—water vapor, and must, therefore, control both temperature and water-vapor pressure.

If the temperature is fixed by other conditions, water-vapor pressure is the factor to be adjusted. The water-vapor pressure may be computed most readily from the following data: *a*, the average molecular weight of the condensable hyrocarbons; *b*, the amount of fixed gas per unit of such condensable hydrocarbons; *c*, the amount of water in a sample of condensate; *d*, the absolute pressure of the total vapor system.

3. *Time of contact between vapors and solution.* Since the total volume of vapors (gasoline, fixed gases, steam) is known from the preceding data, it is a simple matter to compute the volume of treating space required to give the time of contact which preliminary tests show to be desirable. It is interesting to note that this time is measured in *seconds.* As short a period as two seconds is ample under some conditions; 12 seconds is the longest time that has been found necessary so far.

4. *Degree of mixing.* Under the conditions of operation, with a gas being washed by a liquid in which it is practically insoluble, action can only take place in the film at the interface. Intimate mixing is, therefore, paramount, and probably more decisive than any other single factor named. However, once a given type of mixing device has been selected and has become, therefore, a constant factor, the operator may vary temperature, concentration, and also time within rather wide limits at his choice. Time becomes a variable if it is possible to alter the operating pressure, or the rate of vapor flow.

The types of mixing devices that have been employed so far comprise towers filled with va-

*University of California, Berkeley, Calif.

rious sorts of packing, as well as bubble-cap towers. Injectors and mechanical mixers also offer possibilities, but have not been used as yet.

To sum up, then, vapor-phase treatment of gasoline with zinc-chloride solutions is best accomplished by an equipment which brings about intimate mixture of the gas and liquid phases, at a temperature lying between 302° F. and 347° F., where the zinc-chloride solution has a concentration ranging from 70 to 85 per cent, and at such a rate of passage that from 2 to 12 seconds are allowed for the process to complete itself. This time is figured as gross; actually, of course, some considerable space is occupied by the packing material, and it is almost impossible to calculate the net space occupied by the liquid itself; the true period of contact may be less than half the gross time. This rapid reaction permits a correspondingly small equipment; thus, the 5000 barrel-per-day unit now in operation has a volume of only 1100 cubic feet.

Results Accomplished

The following plant figures cover a re-distillation operation during the month of June, 1931. The amount of raw pressure distillate treated daily averaged a little over 5100 barrels (42 gallons each), when in full service; for several days this rate was reduced (see description of this plant below).

Table 1

	Barrels	Barrels	Per Cent
Pressure distillate charged	138,135	.....	.....
410° F. end-point gasoline	.....	124,550	90.13
Gas oil	.....	13,323	9.64
Loss	.....	312	0.23
410° F. end-point content of raw distillate	.....	.....	91.65
410° F. end-point gasoline produced	.....	.....	90.13
Plant efficiency	.....	.....	98.35

The figure labelled "plant efficiency" needs a little explanation, since the determination of how much gasoline of a given end point may be contained in a raw stock of higher end point is by no means obvious.

The method of ascertaining the boiling range of gasoline of the American Society for Testing Materials* gives comparable results in skilled hands, but the figures so obtained have no real significance in determining yields. If a boiling point curve secured by this method is plotted at 10 per cent intervals, and the content of lower end-point distillate is scaled off on this curve, we find an actual tank recovery of refined treated gasoline of 103 to 105 per cent, a manifestly absurd result.

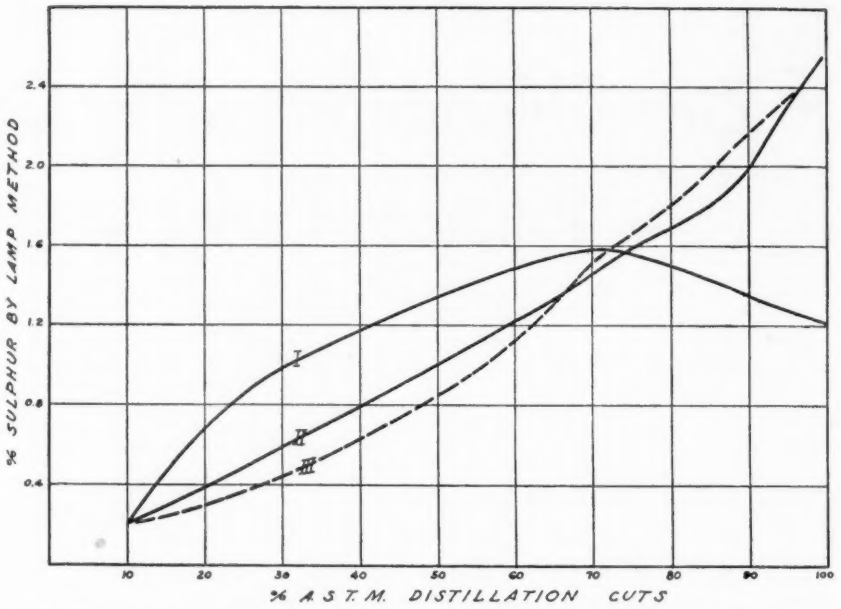


Fig. 1—Typical sulfur distribution in high-sulfur gasoline cracked from California residuum

I Raw stock
II Same after treatment with zinc chloride
III Same after treatment with 15 pounds of 98 per cent sulfuric acid per barrel

After many varied trials, it was found that distillation at a moderate rate of a sample of one liter of the raw stock, through a long glass column containing a 30-centimeter layer of jack chain up to the same end point as given by the A. S. T. M. distillation of the refined stock would yield a distillate having an A. S. T. M. boiling point curve very similar to that of the refined stock itself. The percentage of desired end-point gasoline ascertained in this manner is regarded as the comparison figure. There is no real assurance of its accuracy.

It is clear, however, that the loss of actual gasoline during zinc-chloride treatment is so small as to have little importance. The *over-all* loss of 0.23 per cent is itself probably a trifle high, since no allowance has been made for recoveries in the absorption system.

As the raw distillate under treatment comes from a number of cracking units, the product of which is subject to some variations, daily composite samples of the raw stock and of the treated gasoline are analyzed. A typical set of comparison figures is given here.

Table 2

Comparison of Raw and Treated Stocks

	Raw F.	Treated F.
Gravity, degrees A. P. I.	53.2	55.9
Initial boiling point	99	90
10 per cent point	165	153
50 per cent point	297	280
90 per cent point	395	377
95 per cent point	413	395
End point	437	407
Gum (copper-dish method)	290 mg.	3 mg.
Sulfur, per cent	0.28	0.19
Mercaptans, as molar	0.017	0.007
Color	.....	30

Reduction in sulfur content varies with the nature of the sulfur compounds present. The average reduction is from 25 to 40 per cent. It will be noted that the treated stock is still markedly "sour," but that the amount of mercaptans is considerably diminished. The reduction in mercaptan content seems to be a function of the

*Method D86-30, A. P. I. Standard Method 507-30.

time of contact, other things being equal. It is possible to obtain sweet distillates, but the time required is so great that it is cheaper, in the case of cracked gasolines, to complete the sweetening operation subsequently. When used for the treatment of straight-run vapors, in which the amount of sourness is quite small, a sweet product is secured at once.

With the older methods of refining, which also yield sour products, sweetening is a process requiring great care if color is to be conserved. Zinc-chloride-treated distillates, on the other hand, do not change either color of gum number when sweetened with sodium plumbite and sulfur.

As to color stability, the real test is that of service conditions. The following data are available for a tanker cargo shipped from Los Angeles to Bayonne, through the Panama Canal:

Table 3

	Los Angeles	Bayonne (30 days later)
Color	30	30
Octane No.	68	68
Gum (copper dish), mg.	4	4
Doctor test	sweet	sweet

What Happens to the Zinc Chloride?

The continuous stream of zinc-chloride solution which is mixed with the vapors, either in parallel or counter-current according to the type of equipment adopted must, of course, be voided after its work is done. This may be accomplished either continuously or periodically. In the 5000-barrel unit described below, the spent liquid is discharged once per shift. The amount of zinc chloride fed varies from 1 pound to 10 pounds per barrel of distillate being treated. This quantity may be supplied at any desired concentration, provided only that the vapors carry enough sensible heat to evaporate the solution without becoming cooled below the desired reaction temperature.

Since we are dealing with a system in which a salt solution is in equilibirium with its vapor pressure, the concentration must adjust itself to the value imposed by that pressure and the temperature. This adjustment takes place with extreme rapidity if the mixing is good enough.

So far as the gasoline itself is concerned, the action of zinc chloride is largely a matter of guess work. Except for the side reactions to be considered in a moment, it can only be described at "catalytic." It seems certain that little or nothing happens to the hydrocarbons, saturated or unsaturated. The high ultimate recovery, and the unchanged octane number of the overhead fraction, permit of no other conclusion; and the amount of polymerization is very small. Some portion, but not all, of the pyridine bases present combines with the reagent to form double salts.

The amount of impurities responsible for gum formation and color instability cannot exceed a fraction of 1 per cent; in all likelihood they are aldehydes or other oxygen-containing substances, on which zinc chloride is well known to have a condensing action. This theory is supported by the fact that the higher fractions contain small amounts of highly colored, fluorescent substances.

A small amount of the sulfur reduction shown by the analysis cited is accompanied by the formation of zinc sulfide. This seems to be connected chiefly with the mercaptan reduction. It has been possible to show that mercaptans, as thio-alcohols, react as ordinary alcohols do, to form (thio) ethers:

$$2CH_3SH + ZnCl_2 = CH_3 — S — CH_3 + ZnS + 2HCl \qquad (1)$$

There is, however, another process observed with regard to sulfur compounds; their relative boiling points are changed, as

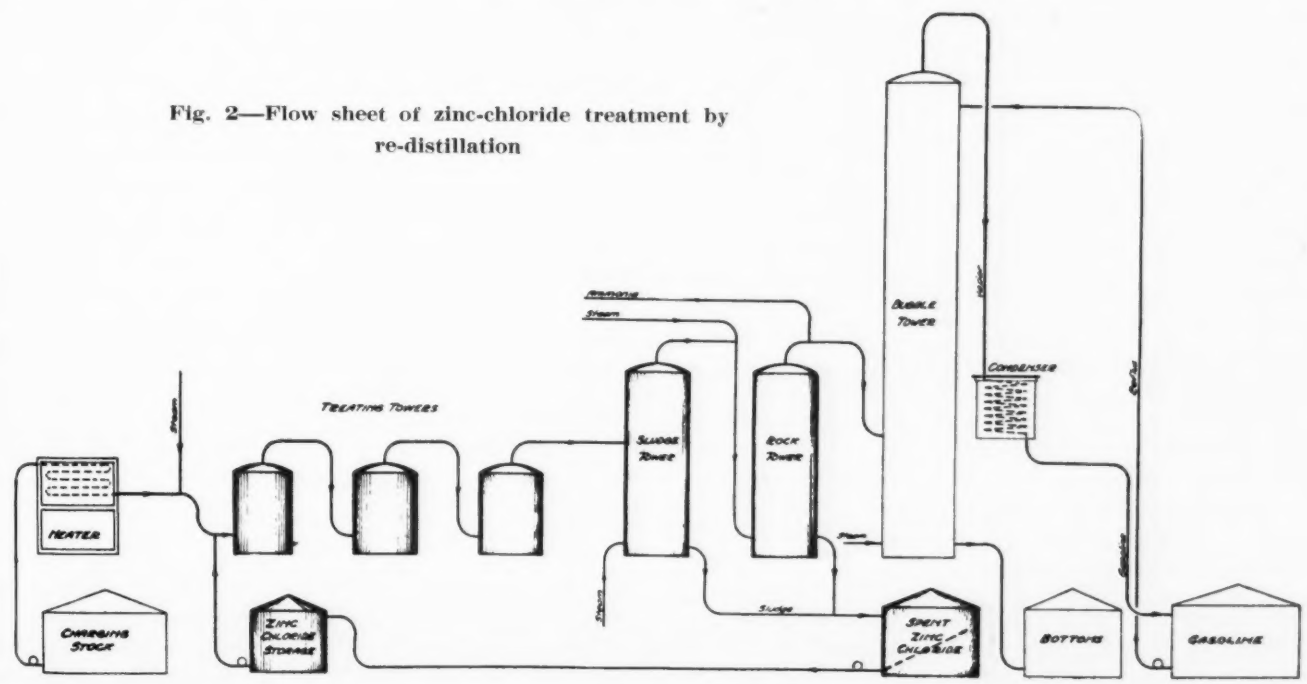


Fig. 2—Flow sheet of zinc-chloride treatment by re-distillation

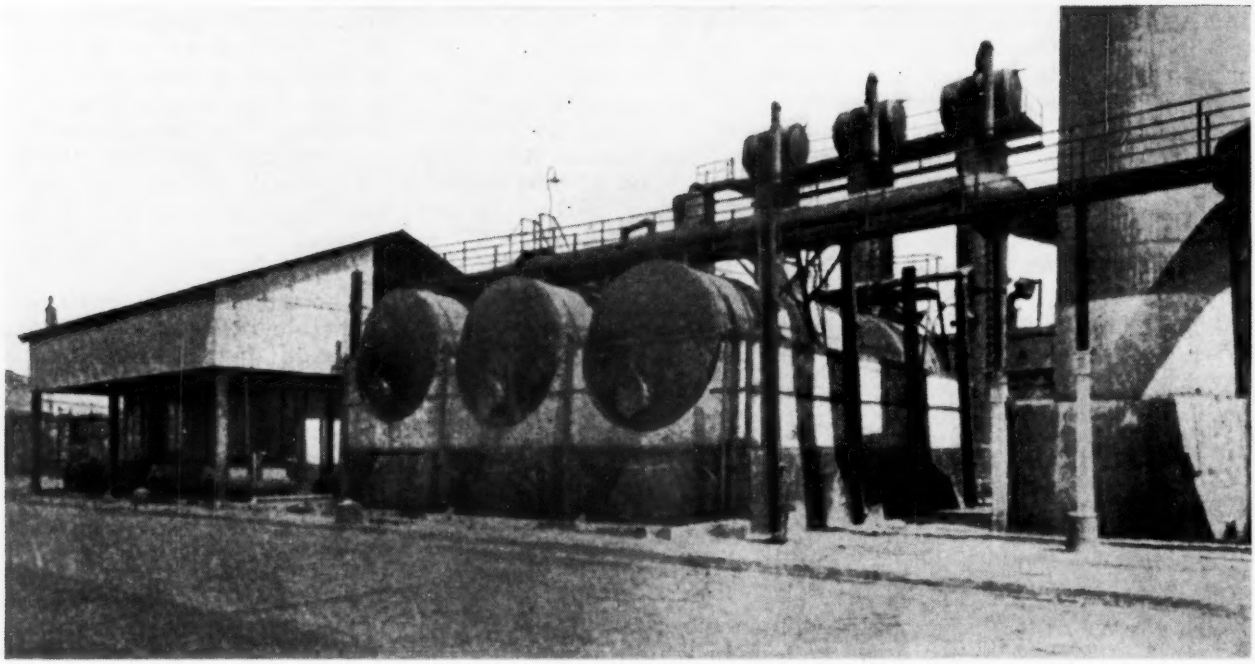


Fig. 3—Four heaters at left. Shell stills used for zinc-chloride storage in center

shown in the curves below. This is a sort of polymerization, so that some of the sulfur removal is really brought about by fractionation. Incidentally, sofar as these same California stocks are concerned, sulfuric acid acts on sulfur compounds in a precisely similar manner.

When directly connected to a cracking plant giving fixed gases which contain hydrogen sulfide, some of the zinc chloride reacts to form zinc sulfide according to the reversible equation:

$$ZnCl_2 + H_2S = ZnS + 2HCl \quad (2)$$

The amount is not large, and the reaction obeys the mass law; the greater proportion of hydrogen sulfide in the gases and the higher the pressure, the more zinc sulfide is formed.

Another reaction leading to slight zinc losses is hydrolysis, also a reversible reaction:

$$ZnCl_2 + H_2O = Zn(OH)Cl + HCl. \quad (3)$$

The hydrolysis increases with temperature, and also with the concentration of the zinc chloride at any constant temperature.

* * *

It is clear, from equations (2) and (3), that hydrochloric acid leaves the treating system with the vapors. The concentration is small, and the vapors are "dry" until the condensing system is reached. No corrosion due to this source has yet been observed, except in the condensers. Here it is combatted in the same manner as is customary with corrosive crudes containing magnesium chloride, by injecting weak sodium-hydroxide solution, or ammonia solution or gas, into the condenser lines as they leave the fractionating towers. A new, semi-automatic method of controlling vapor acidity has been in use for nearly a year, but is not yet ready for description. * * *

Cost of operation: Cost accounting is a mysterious art, and it is almost impossible to compare costs as published by one operator with those given by another, especially if and when the treating systems in the two cases are not identical. We have, however, cost figures for one and the same plant, treating the same stock, by sulfuric acid on the one hand and by zinc chloride on the other. These figures are given in Tables 4 and 5.

No comparative figures are available for operation costs of clay-contact systems. They are much lower than the cost of sulfuric acid treatment, and in some instances seem to be less than the cost of refining with zinc chloride.

Indirect figures, such as plant overhead, etc., have been omitted in the tales, as well as interest and depreciation on the treater itself. The cost of the zinc chloride treater is so small that it may be completely wiped out in a month or two.

Table 4

Comparative costs of re-distillation sulfuric-acid and zinc-chloride treatments on the same raw stock, per barrel treated

Item	Zinc Chloride	Sulfuric Acid
Labor	$0.0096	$0.0212
Fuel	0.0100	0.0168
Water	0.0048	0.0050
Steam	0.0120	0.0122
Electricity	0.0002	0.0054
Zinc chloride	0.0158	.....
Sulfuric acid	.....	0.0442
Caustic soda	.....	0.0323
Ammonia	0.0018	.....
Repairs	0.0040	0.0108
Cost per barrel treated	$0.0582	$0.1479

The above figures do no take cognizance of sludge and polymerization losses, the values of which differ with location and with market prices. The cost of sweetening, which also rises considerably with the type of equipment used, is not included. In the plant described, it is $0.001 per barrel. In Table 5 the gasoline item is figured at $2.10 per barrel, recovered cracking stock at $0.90 per barrel.

This tabulation gives only the direct monetary saving in the refinery. The saving increases with the difference in value between refined gasoline and cracking stock. The average

loss of octane rating due to sulfuric-acid treatment was 4 points. Color stability of the acid-refined stock was poor, shipments arriving at Bayonne 16 to 18 color instead of 30 as at present. Cash adjustments on deliveries were not infrequent, and always expensive.

Plant Construction Problems

The construction of a zinc-chloride vapor-phase gasoline treater offers no serious difficulties. In practically every case, existing equipment can be utilized to the fullest extent. There are three general types of construction corresponding to the three possible modes of operation which will be briefly enumerated here.

Type I—Direct Treatment

In this method, which is suitable for cracking plants directly producing end-point gasoline and operating no more than two or possibly three such cracking units, the treating equipment is merely inserted between the fractionating tower and the condenser of each cracking plant. It has already been pointed out that the volume occupied by the treater itself is quite small.

Type 2 — Re-distillation of Blended End-point Stocks

This mode of operation is best adapted to larger plants having a number of cracking units producing end-point gasoline which, however, may vary slightly in composition from unit to unit. The raw pressure distillates so obtained are blended together and treated in larger vapor-phase zinc-chloride units by the method of re-distillation.

The flow sheet given in Fig. 2 shows the schematic arrangement. The 5,000-barrel unit, whose operating results have been described above, and which is shown in the photographs, Figs. 3 and 4, operates according to this scheme. It consists primarily of a remodeled crude-still battery. This battery was originally composed of four pipe heaters, three shell stills, four flash evaporating towers, and four fractionating towers, each with its own condenser. In order to adapt it to treating purposes, the four pipe heaters were manifolded into a single vapor line, going to the treater itself. The shell stills were disconnected entirely, and are used for storage of zinc-chloride solution.

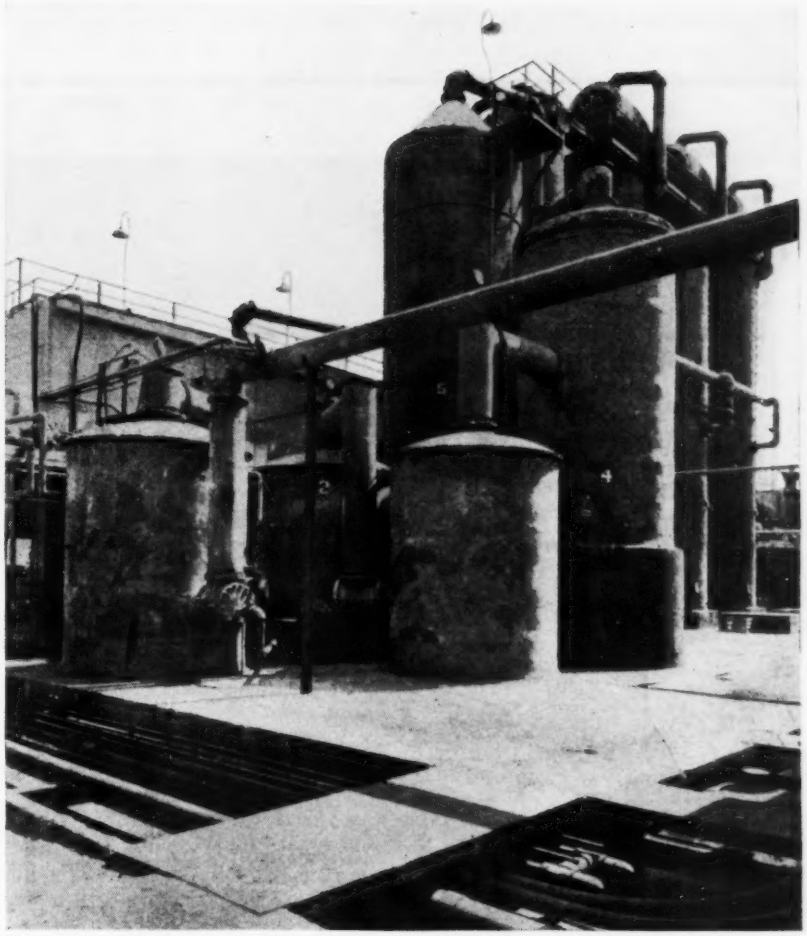


Fig. 4—Small towers, 1, 2, 3, treaters. Tower 4, old evaporator used as sludge receiver. Tower 5, old evaporator used for removal of acid from vapors

The four flash evaporators were also disconnected, one being used as a sludge reservoir from which zinc chloride is discharged three times daily, and a second one for the semi-automatic control of vapor acidity which has been briefly referred to. The vapors after leaving this last tower come to a second manifold, from which they are distributed by means of hand-operated valves to the four fractionating towers. These fractionating towers have varying capacities; and the vapors are, therefore, distributed to them so that each functions to best advantage.

By cutting out one or more heaters and one or more frac-

Table 5

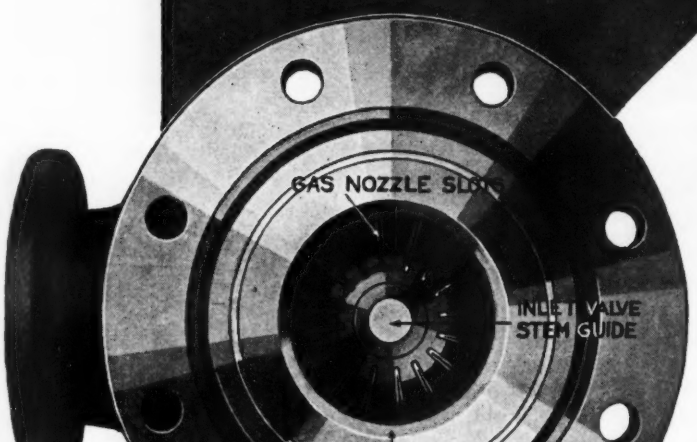
Net values per barrel of pressure distillate treated, with adjustment for polymerization and losses

	Per Cent	Zinc Chloride	Per Cent	Sulfuric Acid
Gasoline recovered	90	$1.8900	73	$1.5330
Gas oil recovered	9.75	0.0428	23.25	0.2093
Loss	0.25	.....	3.75	.....
Gross value of products		1.9328		1.7423
Less refining cost from Table 4		0.0582		0.1479
Net value of products		$1.8746		$1.5944
Saving due to zinc-chloride treatment..		.....		$0.2802

RASIGA

AIR

GAS



Inlet Valve, Gas Nozzle Arrangement

There are many other features described in the

TRANSIT

17 x 24"

Gas Engine-Gas Compressor Catalogue

A copy will be sent you on request

THE above is an attempt to illustrate a complete mixture of the letters in the two words AIR and GAS. With letters the problem is simple; with actual air and gas, the problem was more complex.

We have always been insistent on a homogeneous mixture, because our experience has been that a gas engine is just about as efficient, economical and generally satisfactory as its mixture is perfect. Back-firing, missing, overheating and difficulty in starting are very generally experienced just in the degree that the mixture is imperfect.

The TRANSIT 17 x 24" Gas Engine-Gas compressor has been put through many tests, and all the data and evidence proves a complete mixture of air and gas.

Gas and air are each piped separately from the regulating valve to each of the inlet valves, one of which is illustrated at the left. The vacuum produced on the intake stroke draws in the air over and around the gas nozzles projecting into the air stream, and the correct amount of gas as metered by the regulating valve, is drawn into the air stream through the long narrow slots of the gas nozzles in the form of thin ribbons of gas. This mixture occurs but one and three-quarter inches ($1\frac{3}{4}$") ahead of the inlet valve seat.

The incoming mixture impinges first on the face of the inlet valve and then on the sides of the intake valve openings in the cylinder. The result is a homogeneous mixture.

REFINERY PUMPS FOR HOT OIL
TRANSIT DUPLEX ROTARY PUMPS
PIPE LINE PUMPS

BEAUMONT, TEXAS
E. L. Wilson Hardware Company

SALT LAKE CITY, UTAH
F. C. Richmond Machinery Co.

NATIONAL TRANSIT PUMP & MACHINE CO.
OIL CITY, PA.

PHOENIX, ARIZ.
Pratt-Gilbert Co.

LOS ANGELES
Republic Supply Company of California

ST. LOUIS, MO.
Reeves & Skinner Machinery Co.

NEW YORK PHILADELPHIA CLEVELAND PITTSBURGH LOS ANGELES HOUSTON TULSA NEW ORLEANS

FIELD PUMPS
TOOLS
GAS ENGINES
COMPRESSORS

tionating towers, it is possible to operate the treater at a reduced rate. There is, of course, no real need for this multiplicity of heaters and fractionating towers, but it will be seen that almost any type of available equipment can be utilized to advantage.

Type 3—Re-distillation of Pressure Distillate Requiring Separate Fractionation

This mode of treatment applies to distillates coming from cracking plants in which the final control of end point is made a separate operation; for example, many Dubbs plants function in this manner. The arrangement is similar to Fig. 2, except that a fractionating tower is located between the heaters and the treating towers; the bubble tower at the right can be made much smaller in this case. If the temperature of the vapors leaving the first fractionating tower is too low, it can be raised by operating the tower as well as the treater under a sufficient increase of pressure.

Conclusion

This method of refining gasoline is a radical departure from previous practice in this industry. It combines the ability of sulfuric acid to treat all types of raw stock with the low-cost speedy purification which clay catalysis is able to impart to a limited class of pressure distillates. It enables the refiner to market a cracked gasoline practically free from gums, with the assurance that it will not go off color during storage or transportation.

It may be said safely that this process is past the experimental stage; the laboratory and pilot-plant work covered a period of more than two years. A commercial unit with a capacity of handling from 1000 to 1200 barrels per day was in service for nearly two years more, during which time it was used for all three modes of operation; directly connected to a cracking plant, as a re-distillation treatment, and for the treatment of heavy distillates of the Dubbs type. The 5000-barrel unit just described has been in practically continuous operation for six months. The installation of several other units, in various parts of the United States, is now under consideration.

Bibliography

[1]"Refining of Light Petroleum Distillates," H. P. Rue and R. H. Espach, *Bur. Mines Bull. No. 333.*

[2]Arthur Lachman, U. S. Patent 1,790,622 (Jan. 27, 1931). U. S. Patent 1,809,170 (June 9, 1931). U. S. Patents 1,826,138-47 (Oct. 6, 1931). Other patents pending and many foreign patents allowed pending.

Tide Water Refinery Men Accept Short Week

NEW YORK, Nov. 2.—Employes of the Bayonne refinery of the Tide Water Oil Co. have voted to accept a reduction in the work week from 44 and 48 hours to 40 hours. The hourly pay rate is unchanged which means an average reduction of $4.20 in each employee's pay at 70 cents an hour average.

When the company proposed a reduction in the work-week hours, the employees threatened the strike. The referendum was conducted by the Employees' Association which is independent of management and labor union representation. The only alternative to a reduction in hours per week, the men told, was the laying off of about 125 workers.

Parks Heads Columbia's Gasoline Plants

CHARLESTON, W. Va., Nov. 6—R. N. Parks, for a number of years superintendent of the gasoline properties of the Virginian Gasoline & Oil Co. here, subsidiary of the Columbia Oil & Gasoline Corp., was promoted Nov. 1 to head the construction, maintenance and operation of all gasoline absorption plants of the latter interests.

The Columbia's properties are located at Ohio, Kentucky, Pennsylvania and West Virginia. Mr. Parks will also have charge of sales of gasoline and other products in this territory.

Modern installation of storage tanks at the National Refining Co.'s plant at Grand Rapids, Mich. Capacity of the tanks is 150,000 gallons. Article on page 77, this issue, tells how evaporation losses were greatly reduced through the fitting of the tanks with the vents shown in the illustration

CARS WHEREVER

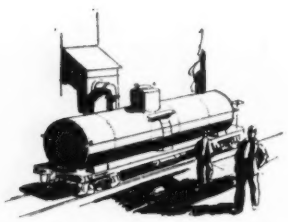
and *whenever* you need them

At ten strategic points throughout the country General American maintains repair plants and storage yards. These serve as terminals for General American's fleet of cars.

The 50,000 cars in the General American fleet, and the strategic location of the General American terminals, provide a transportation service upon which you may always depend.

No matter where you are, or how urgent is your need for cars, you can get from General American *all the cars you want . . . of the particular type you want . . . when and where you want them.*

The convenient location of the General American shops, which maintain a complete stock of tank car parts at all times, enables you to have repairs made without unnecessary delay. No time is lost waiting for the necessary replacements to come from some distant factory. Your cars are back on the rails again in the quickest possible time.



General American has perfected special tank cars for the carrying of butane and propane. If you're shipping either of these products you should investigate them.

GENERAL AMERICAN

TANK CAR CORPORATION

GATX GENERAL AMERICAN

An Apostle of Co-ordinated Effort When the Going was Hard

IT WAS in December, 1928, that Edwin B. Reeser was elected to the presidency of the American Petroleum Institute, the highest honor which the oil industry of the United States can accord any man.

Today, looking backward to the period in the oil industry when he entered upon the duties of this office, his accomplishments can best be summarized as having a major part in assembling the machinery by which, without doubt, the industry will later co-ordinate its efforts to control and stabilize its operations to its own greater efficiency and the greater welfare of the public. This winter will see that machinery given severe and constant usage, but it will stand the test.

The three past years have been trying ones. It has been a period of formulation of policy. The industry has passed in that time from a grudging—at times bitterly contested — acceptance in isolated areas of the theory of production control. At the time Mr. Reeser went into office, one easily recalls, there was a meeting on some phase of proration in Tulsa every day or two. The general policy was formless. A new pool would be coming on the market and a meeting would be called to talk about limiting its output to the amount the pipelines could handle.

Allocation of production by states, fitting each part into the national requirements, was dreamed of by only a few and those few were not yet vocal. The same situation existed in Texas and in California.

No statistical surveys, participated in by the best economists the industry could command, were made to inform every member of the industry as to the probable demand for petroleum products. The time-honored principle of finding oil pools, then stepping up the refinery runs to handle the crude, then attempting to crowd into the retail market all the refined products resulting from such a policy, was still followed. Unfortunately, some would follow it today.

This man who has been president of the industry's most important association for the three years will, perforce and whether he wants to or not, occupy an important page in the history of the oil industry. That history will tell of the long, rutted road that was traveled before the business of producing and selling oil finally came upon a smooth highway, well marked and leading to security both to the public and the units in the industry.

New recognition of the part he has played came within the past month, when formal offer was made to him by the independent oil industry of California to come there and take a new and unique position—the first of its kind in the history of the industry. It is difficult to describe this post without resorting to such worn-out words as "czar" and "dictator," although it is precisely no such thing. In effect, he would be at once a co-ordinating head of the organized industry in that state and a referee in the differences of opinion that arise between companies.

Whether he will acept the place is, as this is written, not decided by Mr. Reeser. It is learned in California that, while the offer was formally made by the independents, the major companies would also be highly pleased and would give Mr. Roeser their hearty support should he accept.

The changes of the past three years have included not only a re-shaping of the industry's policy, but an awakening on the part of the public to the necessity for preservation of oil and gas resources and their wise utilization. It has seen the definite outlining of the principle that recovery of oil from a pool is not solely a matter of property lines.

The training for the part Mr. Reeser was to take in this three-year period goes back 40 years. In 1891 he entered the employ of the Oil City Fuel Supply Co., at Oil City, Pa. He was born in New Ringgold, Pa., in the anthracite coal region, and entered the oil and gas industry because he needed a job.

The reason for his selecting this industry turned solely upon the fact his brother, Harry, assistant treasurer of a Standard company at Oil City, found the job for him. He didn't remain office boy long. He learned about the gas business so rapidly that the following year he was transferred to Sistersville, W. Va., to manage the distribu-

Formal Offer to Reeser Made at Chicago

LOS ANGELES, Nov. 6.—A formal offer will be made inviting E. B. Reeser, president of the American Petroleum Institute and head of the Barnsdall Corp., to become president of the California Oil Producers' Sales Agency and arbiter on ills of the Pacific Coast oil industry.

A special committee, composed of Ralph B. Lloyd, Rush M. Blodget, and Frederick D. Anderson, president, general manager, and assistant secretary of the agency will tender the offer in Chicago next week.

Handling approximately 2,300,000 barrels of crude oil a month through its marketing channels, it is understood the agency may tax the buyers with a small service charge to provide a source of revenue to pay a salary commensurable with the responsibilities the president's position would carry.

tion in that and nearby towns for the Mountain State Gas Co.

The extent of the oil industry when he took the office boy job is evident from the statistics. In that year the daily average production in the U. S. was slightly less than 150,000 barrels daily. The previous year it had for the first time exceeded 100,000 barrels. One-twenty-third of the present daily output under severe proration!

IN THE eight years that followed the moving upward of Mr. Reeser, from office boy to district manager, he gained experience in the gas business in many towns, Marietta, O., DuBois, Pa., Massilon and Canton, O. All this time he was employed by Standard subsidiary companies.

In 1900 he decided the time had come to take advantage of some of the opportunities offered by this growing industry. Leaving the Standard employ, he embarked with the late M. S. Isherwood, whose daughter, Ellen, is Mrs. Reeser, in the producing business in Pleasants county, W. Va. Keener sand wells of small production—a 50-barrel initial producer was one to cause excitement—constituted their holdings.

The business then was one of dealing in what, by present day standards, were small things. The oil market itself fluctuated almost from hour to hour. For a brief time, while with the Standard, Mr. Reeser was in the Sistersville offices of the Joseph Seep Purchasing Agency. A device in the form of a large clock, with the dial marked in one-eighth divisions of dollars, recorded the price. Producers crowded the sidewalk across the street in front of the National Supply Co. store and watched the rise and fall of the market, as quotations were telegraphed from Pittsburgh.

The association of Mr. Reeser with the late T. N. Barnsdall began in 1902 and was broken only by the death of the latter. At the outset it had to do with copper mining. Mr. Reeser went west on behalf of the investors, including Mr. Barnsdall, to supervise the spending of the money and to manage the operations. He lived in Tuscon, Ariz., for a time, later making periodical trips to the property from Pittsburgh. In 1907 the mining venture came to an end and Mr. Reeser returned to oil and gas to find more responsibilities awaiting him.

The Barnsdall Corp. was formed in 1918 and all of the activities of the strenuous T. N. Barnsdall were placed under one head. Mr. Reeser became vice president in charge of production. In its oil aspect, and aside from the several mining and utility companies the corporation owned, it was confined to shallow producing areas; in the Mid-Continent to Osage and Washington counties. In the year prior to the organization of the corporation, Mr. Reeser moved to New York City. There he remained until the general offices were removed to Tulsa in 1925.

In that latter year the corporation made its first big step toward joining the ranks of the large independent, integrated companies. It purchased the Waite Phillips Oil & Gas Co. which brought it a large production, refineries at Wichita and Okmulgee—it previously had acquired the refinery at Bigheart, Okla., now Barnsdall—a distributing system and much undeveloped acreage which later, with the discovery of Seminole, put the corporation into the ranks of the big producers.

SINCE 1925 Barnsdall has gone steadily ahead, adding to its producing position in the major producing states, including California, and has expanded its marketing system to include all of the states in the north and central west. It pioneered in organizing the Great Lakes Pipe Line Co., which now carries gasoline from Oklahoma and Kansas plants of five companies to Chicago and the Twin Cities, as well as to cities along the route of the line.

Through the troublesome past three years Mr. Reeser has kept the friendship of those executives who disagreed, and some of whom still disagree, with the policy of control of production. No matter which remedy he comes around to peddle, "Ed" is welcome in anybody's office. The language may grow heated and vigorous and the debate may be prolonged, but at its conclusion the truce is struck and the warm personal regard is undisturbed. Sincerity always merits such tribute.

He disclaims any thought of having been a public benefactor. On the contrary, he has said repeatedly that he is quite selfish. "The things I have advocated will help the Barnsdall company and that is my chief concern," he remarks.

The chief problem when Mr. Reeser became president of the Institute was one of production control. It still is. The methods of control, however, have been developed. There is still another step to be taken, Mr. Reeser believes.

"Permanent stabilization will only be safe under an interstate compact," he says. "That idea received great impetus at the recent meeting of Kansas, Oklahoma and Texas. No one state can be permanently stabilized without the full co-operation of the adjoining states."

Back in 1924, Mr. Reeser in reply to a questionnaire sent out by the Federal Oil Conservation Board, said he believed the whole matter of production control would be settled if the wastage of gas were stopped. He stands on that assertion today. We are due to hear a great deal on that subject before long.

Aside from his industrial activity, he lives quietly, simply. He participates annually in the croquet, or roque, tournament at Sound Beach, L. I., where he spends part of the summer. He has the delusion, which no amount of proof to the contrary will dislodge, that he can play contract bridge. Golf he knows not, nor fishing. But he can walk the legs off any average golfer.

Erects Additional Storage

TULSA, Nov. 10.—Two 30,000-barrel storage tanks are being erected by the Great Lakes Pipe Line Co. at Okmulgee to augment the eight 6400-barrel tanks already in use there.

The tanks will store gasoline from the Pure Oil Co. refinery at Muskogee, and the Barnsdall Refineries, Inc., and Phillips Petroleum Co. plants at Okmulgee.

Higher Anti-Knock Motor Fuels Aid the Car Builders

By A. Ludlow Clayden

IN CALLING upon us to "Be Our Own Moses," Warren C. Platt let fly with a double-barrel charge of rock salt at both merchandizers and technologists. Probably it was not his intention to include the latter and his remarks on octane numbers were meant to sting the advertising men in the right place; but, whether or not it was meant, the technologist must certainly assume responsibility for octane activities. Please note, I do not say "take the blame" for I think that praise is much more in order.

Competition is always good for a new industry. Racing on road and track, A.A.A. trials, transcontinental records, all these things were necessary to the engineering development of the automobile, even though they were fostered by salesmen. Hot competition drove the engineers to supreme heights of achievement and directors gave the engineers the necessary money for development so their companies could reap the reward of better sales.

Starting not more than three years ago—in public comprehension—motor fuel has moved out of the uninteresting class of goods represented by tacks or buttons and become just as much a feature of motoring as free wheeling or four wheel brakes. Most of our public knows today that gasoline and engines are partners, that a good engine cannot give its best without good motor fuel.

The public is alive to the fact that gasoline is developing and improving; that we can look forward to better future fuels just as confidently as to better future motors.

All the recent uproar has been about knock rating, of course, but that does not mean that the public is capable of grasping only that one quality. The technologists have made the American public gasoline conscious. As results, the public will get better gasolines, the refiner with a better grade product will receive proper credit—and compensation—for making it. Lastly the technologist, heartened by these encouragements, will be spurred on towards something better yet.

Today the technological effort leans perhaps a little heavily towards higher and higher octane. Tomorrow, it will be towards the same octane with better yield or cheaper processing. Next year it may be to higher volatility or to some quality we cannot now envisage. Whatever it may be, one thing is certain and that is we will run our races one at a time. We run just because they *are* races If there were no race everybody would walk, or even sit still and make no progress at all.

OCTANE rating is of very real value to the automotive designer. The general spreading about of information on ratings of motor fuels has provided precise knowledge where previously was only vague speculation. An engine designer today knows what is available in fairly precise terms, and has a definite choice in starting to lay out a new job. Just at present, while the choice is definite enough, it is perhaps a little too wide.

Suppose a popular car is produced needing let us say 65 octane for good performance. Suppose another popular machine comes out with a new model at about the same time, but needing something just a little better, 67 for instance. The former has sacrificed a little on his engine performance if we assume plenty of 67 gasoline at normal price. The latter has built a car too much on the ragged edge if we assume that 65 gasoline represents the market condition.

Looking at it another way, engines of super performance can be built given an adequate supply of fuel of very high rating. There is right now an embryo demand from engineers for fuels better than anything now widely distributed. On the other hand, it is not to be believed that refining will improve swiftly to the point where all gasoline will be made with maximum rating. We must look forward to a long period throughout which there will be considerable difference between the high and the low. The engineer today does know what he may pick for the high. He is safe in laying out engines for fuels 70 to 75 octane. Many think that very soon engines requiring 85 octane fuel will be built and that the gasolines will be ready for them but, while all this applies to the special models and the high priced cars, there is still to much guess work when figuring on an average automobile.

FROM the oil man's viewpoint it is unlikely that any near future automobiles will be built requiring less than 60 to 65 octane, but such cars will run and will run fairly well with proper driving on fuels of considerably lower rating. For such cars, however, the public will undoubtedly demand either regular priced gas of adequate rating of lower price for lesser octane values. The automobile engines for 1932 model cars are going to set the octane value the public will demand for 1932 gasolines. And, being my own Moses for a moment, that is go-

ing to be not far away from a minimum of 65 octane.

Mr. Platt says, rightly, that there is no sense in pushing octane values above the engine's ability to derive benefit therefrom. There is little fear of that happening. An engine appreciates improvement in octane somewhere around five numbers above its minimum for satisfactory performance. Built for 65 it will usually respond to increase in rating up to 70 or a trifle more. Built for 75 it will respond to at least 80. There are quite a few engines being built for over 70 and quite a few in experimental rooms designed for 85 or even more. So the leaders in the octane race need not fear arrival at the goal to find no prizes there.

We are going to have a period —perhaps short, perhaps long —in which there will exist two distinct types of automobile engine. The most common type will be made for what the automobile industry decides is the limit of octane rating to which the oil industry can be pushed for average regular priced fuels. The super type will be made for fuel at least as high rating as the very highest to be found at present.

This is logical and natural. The aim of every automobile engineer is to obtain maximum size and performance of machine from minimum weight. In the average car, performance can be helped by moderation in size and weight of body and chassis in proportion to engine. For the big, high priced car, improved performance can only be secured by obtaining still more power from the same size and weight of engine.

The engine builder today is in a quandary when deciding the compression for an average type car. Suppose he accepts the average rating as being 60 octane and designs for that, then half

In The Excitement, Let's Not Forget Profits

By Warren C. Platt, Editor

A. LUDLOW CLAYDEN, petroleum engineer for the Sun Oil Co., who has specialized on the requirements of the automobile engine, sends in the accompanying article from Detroit with the comment "that it disagrees with Mr. Platt just enough to start an argument that others will take part in."

That is well put. We hope every one will pitch in, for the situation from a profit standpoint is serious. We don't need worry right now about the automobile engineer nor the general public, but just whether the oil companies will make a profit out of gas with good octane numbers.

We do not want to hold back the technical development of the oil industry, in fact we want to have the oil companies make enough money so they can continue their present aggressive technical research.

The point is there is nothing gained by companies getting into heated fights over an octane number more or less that does not mean anything in the motors for which it is intended and for the gasoline price class for which it is designed.

We do not see any objection to the automobile engineers putting out engines calling for 100 octane number or 200 for that matter, providing we can make that grade and that their engines will give satisfaction. Let them put out such motors and we will put out the gasoline for them BUT that gasoline will be in a class by itself and it will be priced accordingly. If it costs us 50 cents a gallon to make 100 octane number that will be considered in the price.

If, on the other hand, sales departments are permitted to say that, "my gasoline is one octane above Jones's" then Jones is sure to come back and raise his competitor's a notch and that will keep on until the technical department is driven to distraction trying to keep up with the claims and demands of the sales departments. In short, if the technical men do not take a firm hold on the situation today, as we suggested in our editorial page 14 issue of Oct. 21, the matter will be taken entirely out of the hands of the technical men and be run by the salesmen who are out on the road.

Let the technical men consider that some fine morning, they may be greeted by the sales departments with something like the following: "Hey there! Is this the refinery? Well, what'ell you fellows doing that you can't keep up with the times? You 'sleep or something? Here's the Common Oil company just dumped 10 gallons of some 75½ octane gas at the One Horse Garage at Smithville this morning and all we got to give 'em is that slimy stuff that you fellows call 74.9 octane. Come on now and fix us up with some red hot 76 octane this morning so we can go out and get some business.

"What? You can't do it. Can't you speed the old machine up a bit and tell the boys to hustle around faster and look at a few more of your fancy thermometers?

"Well you can't eh—too bad. Guess all we can do now is cut the price until you birds wake up and give us some good gas."

We don't mean to be as rough on sales departments as the above may seem but, nevertheless, it is that hot competitive spirit that keeps a sales department on its toes and that keeps it yelling all the time for a better and better product, and also, oftentimes unfortunately, for a lower price.

What the technical men must decide, as well as the higher executives, is will the technical men run the refinery from a standpoint of operating efficiency and will the chief executives insist upon that for profit purposes, or will the sales departments be put in charge of the refinery to see who can turn out the highest octane number every morning, for sales and even price cutting purposes.

his customers are going to be more than satisfied and half not satisfied at all. To design for less than 60 is hardly possible, it handicaps motor performance too much. To design for a bit over 60 is very tempting because there are many suitable fuels, it helps performance, and in poor gas territories a little backing off of the spark setting which the dealer will attend to may take care of the situation. The automobile dealer, anxious that the car he sells shall have the best of reputations, will in turn champion the brands of gas that rate above the car's required minimum.

So, on regular priced gasolines at least within the limits we can now anticipate, there does seem to be very real reason for pushing up the octane rating all we know how. There are very few such fuels above the "appreciative" range of the normal 1931 engine. There are very many still below that engine's actual minimum requirement. Remember I am not talking about new clean motors, but engines in average condition with average carbonization. If and when the average gasoline rating gets near to being good enough for the present specially high compression motor, right then the engineers will move the high compression a step higher. The race now is with regular priced fuels, the race of a year or two hence may likely be up in the nineties.

American Meter Co., 105 West 40th St., New York City, has acquired the Reliance Mfg. Co. and the Reliance Iron Works, Alhambra, Calif. A new company, the Reliance Regulator Corp., is being formed to conduct these newly acquired properties.

Walter M. Thompson, president, and other directors of the former Reliance companies, will be elected to the board of directors of the new company, it is believed. Other personnel of the Regulator division will remain intact.

American Meter Co. manufactures displacement and orifice meters, rate volume controllers and gas and meter testing apparatus for the oil and gas industries.

"Magic" Octane Number Overdone Many Refiners Believe

By Arch L. Foster

N. P. N. STAFF WRITER

CLEVELAND

BOOSTING the anti-knock rating of motor fuels beyond any bounds required by the average automotive engine of today with the resultant further injury to the economic stability of the refining industry, can be avoided by recognition of the unavoidable results of frenzied competition and a co-operative effort to hold individual efforts within reasonable limits. This is the expressed opinions of many refiners in discussing the present trend in gasoline manufacture.

That a steady improvement in octane ratings of fuels is inevitable and desirable they all agree; to deny such a fact would be to render a verdict at variance with all the evidence. But those interviwed also agree that to engage in a continuous rush to raise anti-knock ratings well above any reasonable maximum required by present-day motors, would cause the refining industry needless expense.

"We will raise the anti-knock rating of our present products above the existing values only if forced to do so by raises instituted by competitors, is a statement made frequently in discussing this subject. As it is in the producing fields, however, the refiners fear that such a race is inevitable unless the units of the refining industry recognize the necessity of avoiding a competitive struggle in this direction. "What can be done to avoid such difficulties; how may any recalcitrant members of the industry be induced to keep in line, and not rock the boat?" is a query that has been put more than once.

That an octane rating above the minimum required for satisfactory operation of a motor gives little advantage to the user is indicated in a statement received from the chief engineer of a prominent motor manufacturing company making premium-fuel engines. He states, "Our cars require a minimum octane number of 74, which is the (old) Ethyl standard. Any gasoline with a higher octane number is perfectly satisfactory, although it does not give more power or mileage, but does increase the number of miles the car can be run without cleaning carbon." This appears to be the situation with all premium-gasoline engines in use now. None of them require a fuel higher in knock quality than the present standard, and a boost in this standard will not result in any appreciable advantage to the consumer and may increase the cost of his gasoline to him. One prominent Mid-Continent refiner states, regarding the new Ethyl standard, "My feelings at the present time are that such a high octane numbered gasoline is unnecessary, as there are very few stock cars that require such a grade."

Referring to an editorial suggestion in NATIONAL PETROLEUM NEWS that each man be his own leader in his own business and lead his own company to prices and practices that would yield reasonable profits, this refiner comments on the necessity for co-operative rather than individual leadership as being the thing needed most now. He believes that the wide variation in the estimation of octane ratings, the lack of uniformity in laboratory determinations which can come only with general acceptance of the new standard method and careful handling of the grading system, should dictate the use of good judgment and a tendency to "make haste slowly." "I believe that some of the bad conditions experienced in the oil industry have been due to too many individual leaders and that these leaders have not co-operated with the concentrated

Anti-Knock Standards— Today and Tomorrow

"If the industry is not careful it will find that it has educated the public to a false idea of gasoline value by octane number, just as many companies educated the public to a false idea by using the old Beaume gravity scale which today means just nothing at all as a single standard for gasoline

"Nothing at all is gained by companies' running up the octane number for sales purposes for above a certain point the motor does not know the difference Tomorrow's motor probably will require higher octane numbers but to sell fuel for the motor that does not exist is nonsense"

—Warren C. Platt in National Petroleum News

It's wisdom to make and sell gasoline that fully suits the motors that *do* exist today

Dubbs cracked gasoline does that

It's wisdom to have equipment in your refinery that will produce gasoline

to meet the higher anti-knock needs of the motor of tomorrow

The Dubbs process will do that, too

It's wisdom to blend Dubbs cracked gasoline with your troublesome straight run Then you have a fuel meeting today's anti-knock needs—a fuel you can sell at a profit

Dubbs cracking is the key to the whole gasoline problem—today and tomorrow

Universal Oil Products Co
Chicago Illinois

Dubbs Cracking Process
Owner and Licensor

thoughts of a number of leaders to arrive at a good condition in the industry," he comments. "I believe that leadership which will follow plans devised by leaders of the industry in meetings, to be the better plan.

"In regard to the octane number race, it is rather a difficult subject to comment on. I believe that, while octane numbered gasoline is essential, we do not yet know what the proper division should be and that while a great many distributors are purchasing what is supposed to be gasoline with a certain octane number, they have no means of determining whether they are obtaining this grade of material or not. There are comparatively few places where an octane number determination can be obtained, and in a great many commercial laboratories for instance, the octane numbers which are determined are incorrect. I feel that it is very advisable to go slow in grading these materials, and feel that the industry is apt to find itself in a very chaotic condition regarding this grading, if it is not well handled."

CONVICTION that intelligent and careful grading of anti-knock quality in motor fuels is the best that can be expected now, in view of the lack of intelligent co-operation between refining units, is expressed by Charles L. Suhr, president of the Pennzoil Co., Oil City. He points out the ultimate futility of the effort to forge ahead of the average in a race where all have the same chance to meet increases, without an increase in the returns, which can only mean loss to every one concerned. "Your editorial in the Oct. 21 issue is indeed logical and doubtless in accord with the views of the great majority of refiners," he says. "All agree that this race for octane quality is costly and altogether unnecessary, but they all say 'What are we going to do about it?'

"We will, if we care to look around, likely locate the trouble where most of our difficulties emanate—a woeful lack of co-operation in the industry.

"I grant that it is quite intriguing to bring out something better than the other fellow has, at a cost for the time being not quite commensurate with the temporary advantage gained, but one's joy is short-lived as a rule, because, if the new material is pulling business, then it is only a matter of weeks or months when everybody is doing it, with the result that costs are raised along with the standards, while the price remains the same.

"Properly grading the gasoline as to octane rating is the best we can hope for in the absence of intelligent co-operation."

C. B. Watson, vice-president of the Pure Oil Co., believes that the introduction of a second "leaded" gasoline would possibly do a great deal toward standardizing the two higher grades of fuel. In such event he thinks a race for anti-knock value would probably be precipitated in third grade fuels, or at least that the rating of this "thrift" gasoline will gradually go upward.

"Referring to your article on octane number," says Mr. Watson, "it is our thought that, if the third grade of gasoline had been introduced only in the areas where destructively low prices made the introduction of the third grade advisable, there would be very small chance of a serious race on octane numbers. However, in those areas where third grade has been introduced at every point it seems to us that it is only reasonable to expect a gradual increase in the octane number of the third grade and a resulting race on this particular product. If the Ethyl Corporation eventually allows lead to be introduced into a second grade gasoline, as well as the Ethyl grade, the quality of these two products will be pretty well standardized and it is our firm belief that a race will result for quality in the third grade. We certainly agree with your thought that such a race would be destructive to possible profit."

"THERE are still many things to sell in gasoline and gasoline service besides octane number," R. R. Irwin, president of White Eagle Corp., believes; "There are certainly limits to the specification the refiner should immediately undertake with respect to this test. It does not pay to spend too much money for what might later be conversational purposes." In discussing this same phase of the subject before the Four-State Jobbers Association in Kansas City a few days ago, R. C. Alden, research director of Phillips Petroleum Co., pointed out that volatility and purity still hold the same importance to the gasoline user that they have during the last decade. The emphasis on octane numbers should not lessen the attention paid to the other important qualities of a motor fuel, he believes.

THAT octane number is a "magic number" which has led or may lead the refiners into extravagances which are of at least doubtful value appears to be the opinion of H. B. Setzler, general superintendent of National Refining Co. at Coffeyville, Kans. "You are correct, my boy—you are correct about the magic number, octane," he writes.

"Refiners appear, according to gossip here, there and elsewhere, to have gone plumb crazy about the magic number. ————informed me that in the past two weeks, they have had something like eight to ten inquiries from refiners for equipment to produce that magic number.

"None of we refiners appear to have any ideas as to how high the magic number shall ultimately go. I suspect the manufacturers of equipment to produce the magic number are in the same boat. Believe it or not, the manufacturers are going to build some kind of equipment to produce some kind of a magic number."

According to the results of the Bureau of Mines-Bureau of Standards survey of anti-knock ratings of composite fuel samples for 1930, the averages for different sections are approximately as follows, in octane numbers for regular grades: east, 65; midwest, and Mid-Continent, 57; Pacific coast, 61.5. As these determinations were made on composite samples and not on individual samples, the results must be considered as representing the order of magnitude of the average rating, and not as exact figures from which definite conclusions may be drawn.

Sulfur in Extreme-Pressure Lubricants Gives Properties Desired

by

H. C. Mougey and J. O. Allmen*

(Presented before American Petroleum Institute, Chicago, Nov. 10-12).

THE authors believe that chemical action may explain the improvement of lubricants, in extreme-pressure lubrication, to which different chemically-active materials have been added. Such additions show remarkably improved lubricating action after film lubrication has failed.

His study was made with the aid of a new testing method and equipment which is explained in detail in the article.

Sulfur added to lead-base lubricants increases lubrication far beyond the limits found for the sulfur-free product. A 10 per cent water solution of sodium oleate showed the best results. Castor oil shows action similar to that of sulfurized oils. Three per cent CCl_4 in mineral oil gave lubrication nearly equal to sodium oleate.

WE ARE accustomed to think of lubrication as a condition in which a film of oil prevents the rubbing surfaces from coming into contact with one another, and thus prevents wear. That this condition actually exists in well-lubricated bearings is well known; but it is not so well understood that this conception of lubrication does not apply to highly loaded gears.

In well-lubricated bearings the loads rarely exceed 2000 pounds per square inch projected area, and the rubbing speeds are generally high enough to maintain a film of oil which separates the bearing and journal. In automobile gears, the pressures between gear teeth reach values as high as 400,000 pounds per square inch, with rubbing velocities ranging from 0 to 300 feet per minute, and this between convex curvatures which are poorly adapted to maintain a lubricating film.

It is inconceivable that even the most viscous oils and greases can be retained between the surfaces of the teeth in a sufficiently thick film to prevent metallic contact, particularly when it is realized that operating temperatures of over 210° F. are common. With these conditions prevailing, it is not difficult to imagine that we are fast approaching the limit of capacity of ordinary oils. The fact that we are not now in difficulties can probably be attributed to the intermittent nature of the loading which permits time for temperature equalization between periods of load.

*General Motors Corp., Detroit.

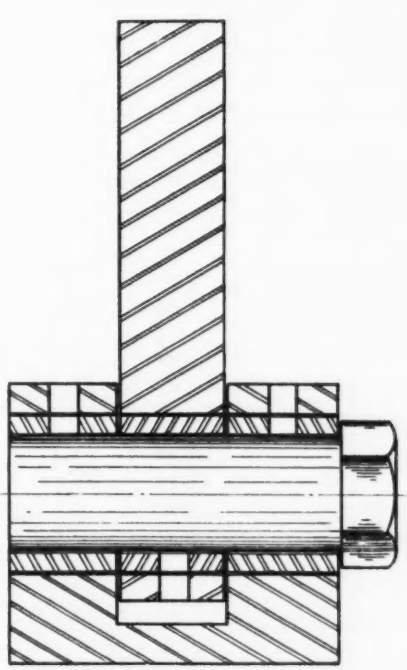


Fig. 1—Assembly of journal, bearings, retainer and link used in testing heavy duty lubricants. Pressure is applied to the top of the link, shown in a vertical position

Since it was improbable that any ordinary oil or grease was capable of maintaining a fluid film between gear teeth, an investigation was directed toward the problem of preventing galling or scoring between heavily loaded sliding surfaces. This work was originally done on complete rear axles in a dynamometer set-up, in which it was possible to reproduce conditions of seizure between the differential pinions and pin identical with service failures that were at that time occasionally found in certain districts.

This was done by locking one wheel and taking the load through the differential. This test, however, was slow and expensive. A special machine was, therefore, built which approximated the essential parts of the axle test, i. e., a hardened steel pin rotated in hardened steel bushings, the assembly being immersed in the oil to be tested. The details of this machine are shown in Fig. 1 and 2. Fig. 1 shows the journal and bushings mounted ready for test. This assembly is immersed in an oil bath, as shown in Fig. 2, which also shows the loading means. The journal is then rotated by means of a dynamometer from which the torque required to rotate the journal can be determined.

Operating the Testing Machine

The usual method of operating this machine is to rotate the journal at 100 r. p. m. with a constantly increasing load of 1000 pounds per square inch projected area applied every 10

seconds until a total load of 25,000 pounds per square inch is reached or until seizure occurs. In operating this testing machine, it was found that when we made tests with ordinary lubricants with steel against steel, at certain loads and speeds, seizure or scoring resulted; but it was also found that seizure could be prevented if another metal was substituted for steel as one of the wearing surfaces, for example, steel against bronze.

Tests established that there are a number of metals and alloys that could be substituted for bronze and operated against steel, and still avoid the difficulties that occur with steel against steel; but there is the objection to most of these metals that they are low in strength and are not suitable as gear materials.

We found that by means of electroplating different metals on steel we could get the benefit of the wearing surfaces of the plated metal and the strength of the steel backing. We also found that by mixing finely divided metal powders with the oil we could get the same results as if the metals had been plated on the bearings with the exception, however, that we could not keep these powders in suspension for any length of time. Very much to our surprise it was found that we could operate steel against bronze and certain other metals with no lubricant whatever using loads and speeds that would result in seizing or scoring, if we used steel against steel with ordinary oils or greases.

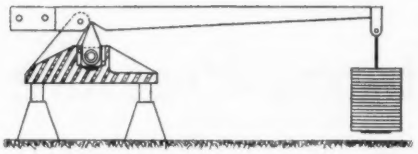


Fig. 2—Complete testing assembly, showing application of pressure through lever to link

In Fig. 2 curves are shown of tests in which steel journals were operated against steel, bronze, or tin plated steel with lubricant whatever or with various lubricants. In this figure, the vertical lines on the test of steel on steel with mineral oil and with the tin-plated journal dry indicate seizure of the journal and bushing. The others completed the test without seizure.

Photographs of some of the journals used in this and other tests are shown in Fig. 4. The photograph of the journal from the test on tin-plated steel run dry was made from a test stopped at 15,000 pounds, as it was not possible to operate the tin-plated steel with no cooling medium at the full 25,000-pound load. The journal operated with bronze with no lubricant appears to be badly worn in the center, but actually there is practically no wear on this journal. It simply became so hot during the test that the steel did not have enough strength to carry the load and the journal was extruded. This same condition has been observed with other steel journals tested with certain experimental lubricants.

How "Extreme-Pressure" Lubricants Operate

There remains a serious objection to the use of plated metals for highly-loaded moving parts in that, if the plate should be worn off in service, the steel would then operate against steel with unsatisfactory results. If a lubricant could be developed which would form on the surface of the steel a film or plate with a low coefficient of friction, similar in effect to that of the film or plate of electro-deposited metal, and if this film or plate would be reformed automatically as it is worn off in service, this might be a solution of the problem. We believe that some such phenomenon enables the so-called "extreme-pressure" lubricants to operate.

In Fig. 5 are shown results obtained with three ordinary mineral oils and one commercial "extreme-pressure" lubricant. The mineral oils have viscosities of 48, 90, and 200 at 210° F., respectively. The "extreme-pressure" lubricant has a viscosity of approximately 90 at 210° F. It will be noted that viscosity effect is quite marked, in that the 200 viscosity oil shows a low friction up to 10,000 pounds per square inch,at which point the oil film fails with a consequent rapid rise in friction, and that the oil films with the lower viscosity oils, as would be expected, fail at much lower loads.

Since the initial oil temperature in these tests was about 70° F., it is evident that in service where temperatures of 200° F. are common, even the heaviest oils are incapable of sustaining very high loads. The heaviest oil shown in Fig. 4, if heated before the test to 200° F., thus

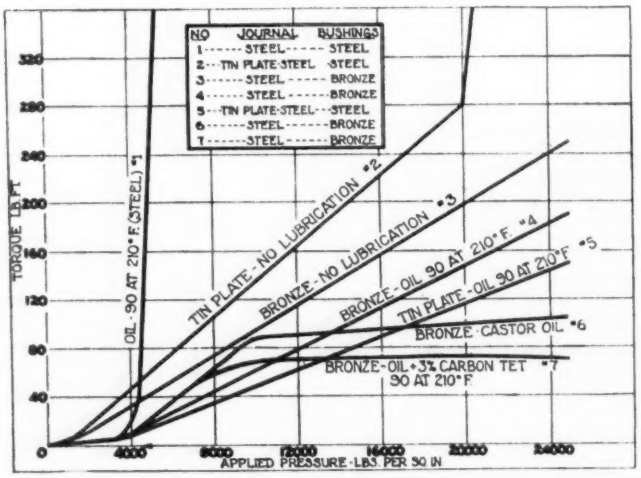

NO JOURNAL BUSHINGS
1 STEEL STEEL
2 TIN PLATE STEEL STEEL
3 STEEL BRONZE
4 STEEL BRONZE
5 TIN PLATE STEEL STEEL
6 STEEL BRONZE
7 STEEL BRONZE
TORQUE - LB. FT.
OIL 90 AT 210° F. (STEEL) *1
TIN PLATE - NO LUBRICATION *2
BRONZE - NO LUBRICATION *3
BRONZE - OIL 90 AT 210° F. *4
TIN PLATE - OIL 90 AT 210° F *5
BRONZE - CASTOR OIL *6
BRONZE - OIL + 3% CARBON TET 90 AT 210° F *7
APPLIED PRESSURE - LBS. PER SQ. IN.

Fig. 3—Results of tests of steel journals with bushings of different metals

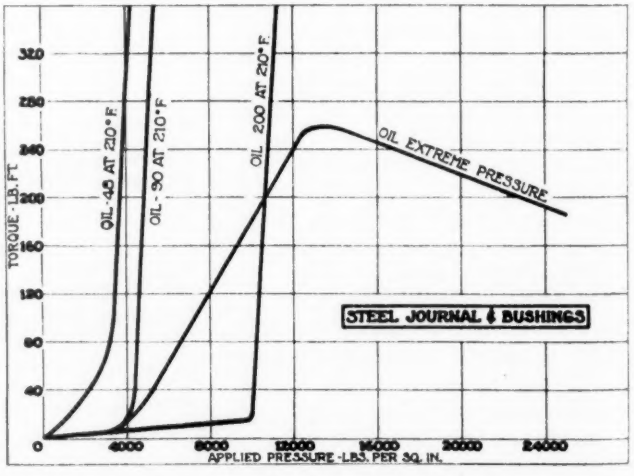

TORQUE - LB. FT.
OIL - 48 AT 210° F
OIL - 90 AT 210° F
OIL 200 AT 210° F
OIL EXTREME PRESSURE
STEEL JOURNAL & BUSHINGS
APPLIED PRESSURE - LBS. PER SQ. IN.

Fig. 5—Comparison of lubricating efficiency of straight mineral oils with an "extreme pressure" lubricant

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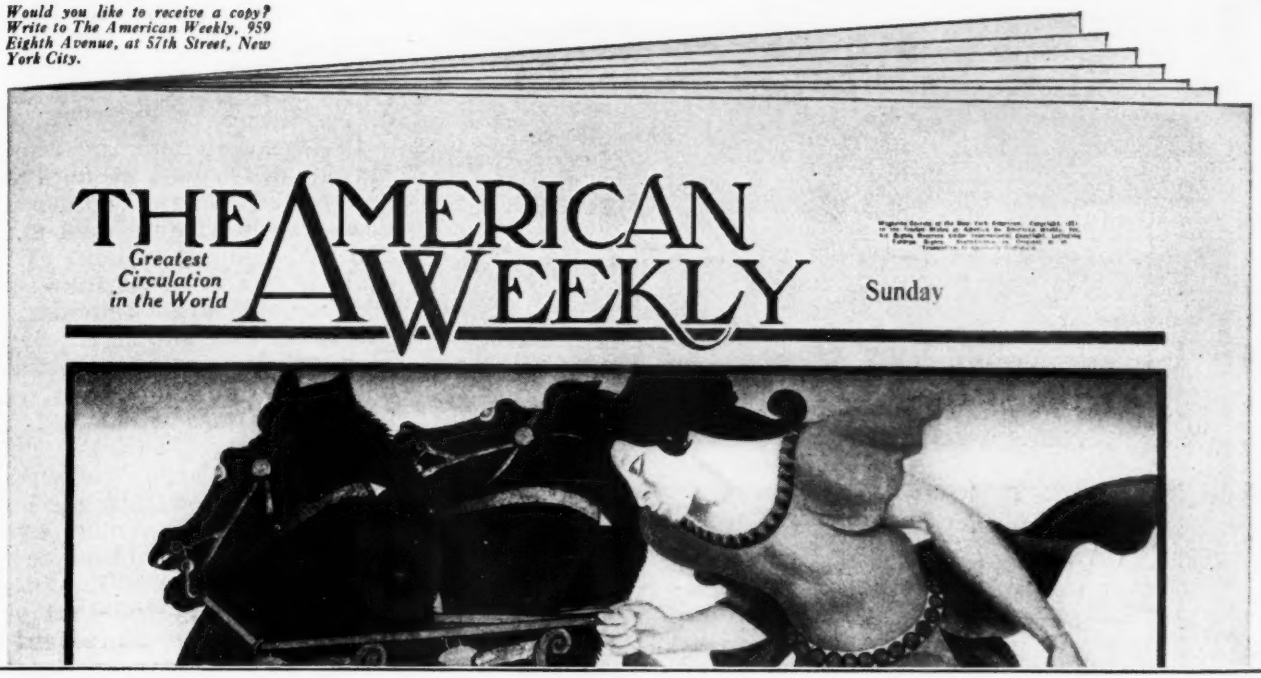

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Love Stories the Ancients Believed In
By the Distinguished English Artist
Edmund Dulac

PERSEPHONE AND PLUTO—

PERSEPHONE, whom the Romans called Proserpine, was the daughter of Ceres, who was the Goddess of Earth. One day there was a great volcanic outbreak of Mt. Etna, and Pluto, the God of the Underworld, or Abode of the Dead, came up from below to see what damage had been done. Venus, for a joke, had her son Cupid shoot an arrow of love into the Dark Monarch's heart. His eyes fell upon Persephone, and he kidnaped her. When she didn't come home Ceres went all around the earth searching for her. In her sorrow she forgot to look after her business of keeping the trees and plants fresh; vegetation began to wither and die, and humanity appealed to the gods for farm relief. Jupiter patched up a truce between Pluto and his mother-in-law whereby Persephone spent half the year with each of them. Then all the plants became fresh again.

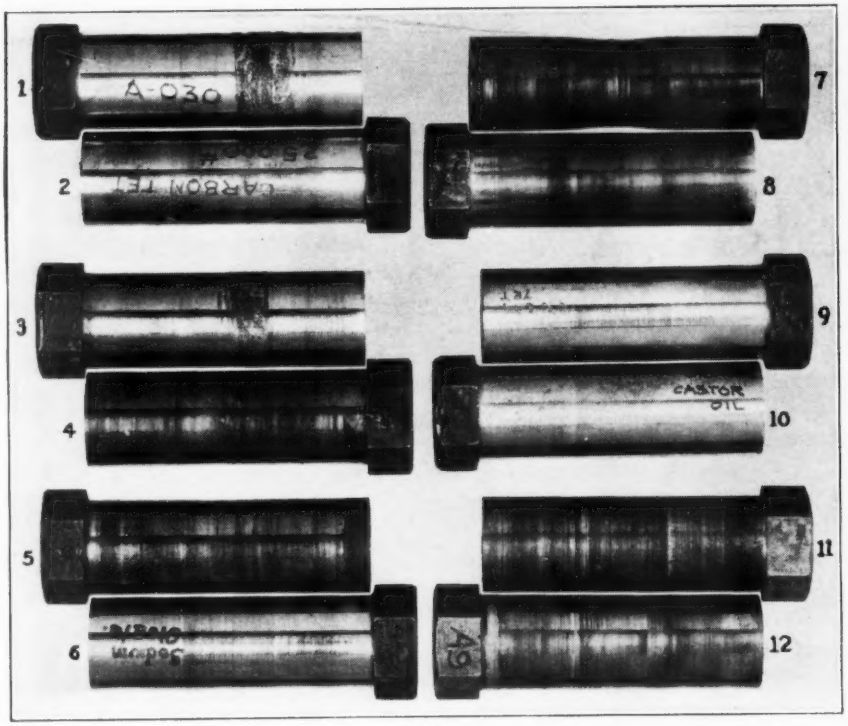

Fig. 4

1—Oil—48 at 210° F. Steel journal and bushings.
2—Same oil as above with addition of 1 per cent carbon tetrachloride. Steel journal and bushings.
3—Oil—90 at 210° F. Steel journal and bushings.
4—Oil—90 at 210° F., plus sulfur. Steel journal and bushings.
5—Commercial lead-soap grease containing sulfur. Steel journal and bushings.
6—10 per cent soap (sodium oleate) plus 90 per cent water. Steel journal and bushings.
7—No lubricant whatever. Steel journal, bronze bushings.
8—Oil—90 at 210° F. Steel journal, bronze bushings.
9—Oil—90 at 210° F., plus 3 per cent carbon tetrachloride. Steel journal, bronze bushings.
10—Castor oil. Steel journal, bronze bushings.
11—No lubricant whatever (test stopped at 15,000 lb.). Tin-plated journal, steel bushings.
12—Oil—90 at 210° F. Tin-plated journal, steel bushings.

reducing the viscosity, will give results similar to an ordinary engine oil tested cold. In the case of the "extreme-pressure" lubricant, the curve indicates it behaves exactly like any ordinary oil so long as the oil film is maintained.

The addition of other materials to the oil does not affect the characteristics until the oil film has failed, whether the oil be light or heavy; but at higher loads there is a sudden transition from one friction level to another. These results indicate that lubrication at this higher friction level is accomplished by some medium having properties different from oil as used in ordinary film lubrication.

Sulfur Active Ingredient in Successful Lead-Soap Lubricants

In Fig. 6 are shown three oils with viscosities of 48, 90 and 300 at 210° F., respectively; but these oils have all been sulfurized. It will be noted that in the "extreme-pressure" region the friction is approximately the same for all three oils, but an interesting difference occurs in the transition region in that the maximum friction is least for the light oil and greatest for the heavy oil. However, by reducing the viscosity of the heavy oil by the addition of light oil or kerosine, the point of maximum friction can be lowered.

We believe this indicates that the film which carries the load in the "extreme-pressure" lubricant region is caused by chemical action requiring heat, and that this high friction shown by the heavy oil results from the layer produced by chemical action not having enough time to form before it is required to carry the load.

For a number of years, lead-soap lubricants have had the reputation of carrying higher loads than ordinary mineral oil lubricants. We tested in our laboratory commercial lead-soap lubricants, and found that some of them had this superior load-carrying ability and that others did not.

In trying to find the reason for this difference, we analyzed and tested many commercial lead-soap lubricants, and made and tested many others. Very early in our work we found the presence of large amounts of sulfur in the successful lead-soap lubricants, with usually much smaller amounts of sulfur in the ones which did not carry the extreme loads. This, together with the knowledge that flowers of sulfur has long been used to overcome overheated bearings, and that sulfur oil is extensively used in cutting lubricants, suggested that sulfur was the active ingredient in successful lead-soap lubricants.

We made experimental mixtures where we added sulfur to mineral oils low in sulfur, and found that by this addition the oil was able to carry the heavy loads, whether lead soap was present or not. We added lead soap to mineral oils low in sulfur, but we were never able by this means to improve the load-carrying ability; although in some cases, when we added lead soap to oils which were high in natural sulfur, we obtained superior load-carrying properties.

Lead soap added to sulfur-free mineral oil does not seem to increase its load-carrying ability, but lead soap added to pure castor oil does make an "extreme-pressure" lubricant which works effectively beyond the range of castor oil. Lead soap added to a mineral oil containing enough sulfur produces an "extreme-pressure" lubricant that seems to make the transition from "fluid-film" lubrication to "extreme-pressure" lubrication with less friction and heat than a sulfurized mineral oil without the lead soap or other materials which might help in the transition range.

Acids in Castor Oil Have Action Similar to Sulfur

In testing these lubricants, we found that when these successful lead-soap lubricants were operated under conditions where mineral oil without these additions could not carry the loads, in all cases except that of castor oil plus lead soap, the

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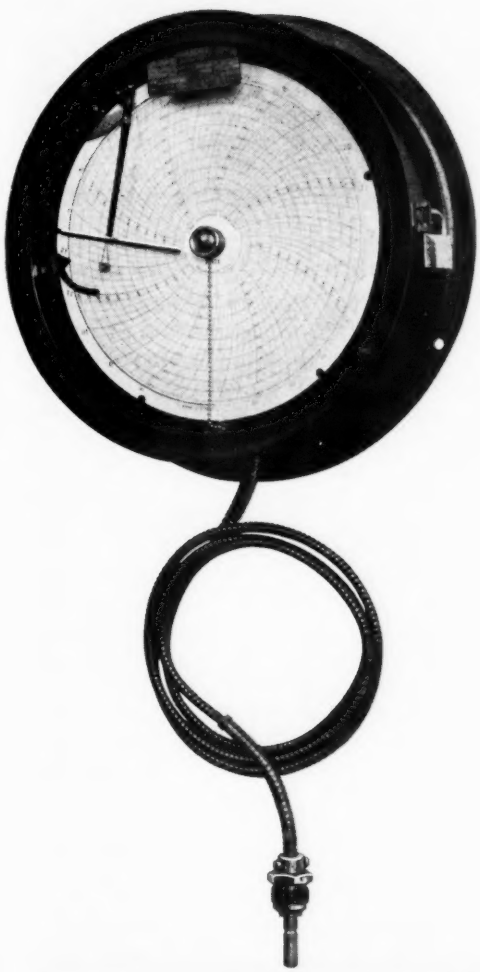

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surfaces of the steel were covered with a black film, which analysis indicated to be iron sulfide. In the case of castor oil plus lead soap, we believe the acids in the castor oil have an action similar to that of sulfur.

These investigations indicated that the superior load-carrying properties of "extreme-pressure" lubricants were due to the formation of a separating film not of oil but of some material formed directly on the surface of the steel. This theory is similar to that which is held by many investigators seeking to explain the peculiar oiliness properties of animal and vegetable oils and mixtures of these with mineral oils. If this were true, it would be necessary for an oil to contain chemically active material to function as an "extreme-pressure" lubricant, and it seemed likely that other materials than sulfur should have similar properties.

To test this theory, we went to the chemical stock room and selected a large number of chemicals, and tested them as lubricants for extreme-pressure conditions. We found certain esters, such as benzyl benzoate, dibutyl phthalate, etc., which have chemical structures more or less analogous to animal and vegetable oils, which gave lubricating results in our tests comparable to animal and vegetable oils. In general, this type of material will give a lower coefficient of friction than ordinary mineral oil when tested under conditions that are slightly too severe to permit the operation of a mineral oil, but it usually fails to carry the real extreme pressures.

Among the most interesting of the materials that may be used to increase the load-carrying capacity of lubricants is chlorine in various forms, such as carbon tetrachloride, etc. When such material is added to ordinary oil in quantities from 1 per cent up, the test results are quite startling, as shown in Fig. 7.

In testing some of these compounds, we found that iron chloride was formed on the surface of the steel; and it is our belief that the superior load-carrying ability of these chlorine containing materials is due to their action in forming iron chloride on the steel, which apparently acts as a separating film capable of sustaining extreme loads.

A striking example was the case of dichlorethyl ether. This is a very fluid material of about the consistency of gasoline. It boils at 349° F. (176° C.), and from its physical appearance it certainly would not be selected as a high-load-carrying lubricant. In our tests, this material, in its undiluted state, was found to be equal to the best "extreme-pressure" oil or grease ever tested by us in its load-carrying ability and low-friction characteristics; and at the completion of the test small amounts of iron chloride could be scraped from the container in which the test was made, although the steel wearing surfaces appeared to be unaffected, and as smooth and bright as when the test was started.

This test appeared to demonstrate that the viscosity of the lubricating oil is of little importance as regards its load-carrying ability in the extreme-pressure region. Tests of commercial lubricants have shown that there are on the market a number of lubricants for which great claims are made and which contain various chlorine compounds.

Sodium Oleate a Good Lubricant

One of the best lubricants tested was a 10 per cent solution of soap (sodium oleate) in water. This material gave a lower friction and a better appearing journal at the end of the test than any other lubricant we have tested. The results of this test are shown in Fig. 7. In contrast to this, the same amount of sodium soap added to mineral oil, and subjected to the same test, gave results comparable to ordinary mineral oil of high viscosity.

These tests emphasize the importance of the body of the lubricant as a cooling medium as well as that of a carrier of the chemically active material. Since high-pressure lubricants appear to act chemically, care should be used to select such materials as will be active when needed, but not corrosive or active when they are not required to develop this property. Too much attention should not be paid to empirical laboratory tests to determine these properties.

There has been a wide commercial use of sulfur-containing lubricants, especially those used for cutting oils; and yet it would be easy to develop laboratory tests that would indicate such sulfur containing lubricants would be dangerous from a corrosive standpoint.

Attention should also be called to the fact that under conditions where ordinary mineral oil is satisfactory, such as fluid-film lubrication, it is usually impossible to show any improvement due to the addition of these chemically active materials. In addition, a lubricant may be an "extreme-pressure" lubricant when used with one combination of metals and under certain conditions, and yet it may be only an "ordinary" lubricant, or worse, when used with other combinations of metals or under other conditions.

Theory of Chemical Action of Lubricants Requires Study

If this theory of chemical action of the lubricants on the surface of the steel is correct, then there is a possibility of undesired chemical action in some cases. As a general rule, the manufacturers of ball and roller anti-friction bearings have been opposed to the use of the special lubricants, particularly the lead-soap lubricants, on account of their belief that they decrease the life of ball and roller bearings. It is evident that it would not be a solution to the problem to develop lubricants that would lubricate gear teeth and cause failures of the ball and roller bearings, and a lubricant in order to be satisfactory must operate both with the gear teeth and with the anti-friction bearings. However, tests have shown that extreme-pressure lubricants are not of necessity injurious to ball and roller bearings; and, therefore, this whole subject requires careful consideration on the part of both the lubricant makers and the bearing makers.

Only Actual Service Data Reliable

We feel that in all this work

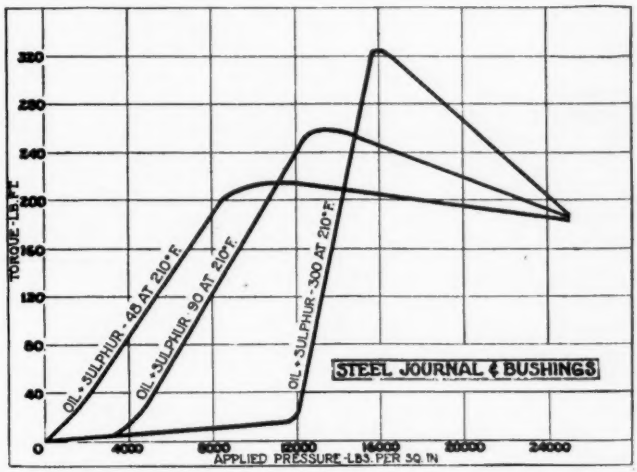
TORQUE-LB.FT.
APPLIED PRESSURE-LBS. PER SQ. IN.
OIL + SULPHUR - 45 AT 210°F.
OIL + SULPHUR 90 AT 210°F.
OIL + SULPHUR - 300 AT 210°F.
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Fig. 6—Results of testing oils which have been sulfurized

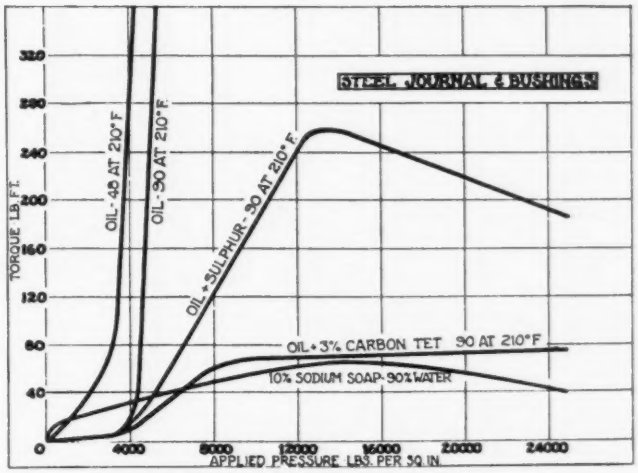
TORQUE LB.FT.
APPLIED PRESSURE LBS. PER SQ. IN.
OIL - 45 AT 210°F
OIL - 90 AT 210°F
OIL + SULPHUR - 90 AT 210°F.
OIL + 3% CARBON TET 90 AT 210°F
10% SODIUM SOAP-90% WATER
STEEL JOURNAL & BUSHINGS

Fig. 7—Addition of different materials to oils shows startling results in some cases

great care should be used in interpreting results obtained with any laboratory testing machine or method. The lubricants are not made to lubricate testing-machines but rather to lubricate gears and bearings in actual service; and only actual service data, or data that can be related to service, should be used.

In operating the test machine developed in our laboratory, we have found that by varying the speed of rotation of the pin or by varying the rate at which the load is increased, we can develop contradictory results. This is probably also true of all laboratory test equipment now in use.

Before a testing procedure could be decided upon, we found it necessary to determine the properties of these lubricants by actual service data; and until this was done we could not establish the relative merits of any of the lubricants tested. It makes no difference if the laboratory testing equipment consists of an actual set of gears in a transmission or an axle or whether the test is conducted in a car or on a test fixture. The conditions of load and speed, if arbitrarily selected, may not be representative of service conditions; and results of such tests are, therefore, not reliable unless they are checked by actual service.

There is a large potential market for "extreme-pressure" lubricants; but before this market can be developed, certain factors must be recognized and difficulties introduced by them overcome. The large automobile companies cannot put out designs requiring special lubricants until the oil industry generally is in a position to supply them and until tests are developed by which the satisfactory lubricants can be distinguished from the unsatisfactory ones.

As previously mentioned, roller and ball bearing companies at the present time are opposed to extreme-pressure lubricants as a class, as they maintain that they cause rapid wear on roller and ball bearings. Until this situation is cleared up, the large automobile companies cannot take advantage of the extreme-pressure lubricants.

It is evident that until designs calling for extreme-pressure lubricants are produced and distributed in quantity, the volume of business in extreme-pressure lubricants for automobiles is necessarily limited. The problems that are involved are too great to be solved in any reasonable time by any one individual or company, but will require the co-operation of all industries affected.

NEW EQUIPMENT

McLeod & Henry Co., Troy, New York, have recently issued a 32-page bulletin, No. 231, describing their boiler furnace linings, walls and arches made of "steel mixture" refractories.

This bulletin explains in detail the different arrangements of settings for water tube and horizontal return tubular boilers, fired by oil or by coal with various types of stokers. Flat suspended arches for water tube, and back combustion chamber arches for h. r. t., boilers are featured along with some other furnace and boiler door arch designs. Solid and semi-solid air cooled sectional furnace walls, veneer and suspended walls, are described, with explanation of the purposes and advantages of each.

A description of other "steel mixture" products is included, such as blow-off pipe protectors, baffle tiles, firebrick, fire cement, repair daub, etc. Illustrations of photographs of installations, and two-color drawings are given, showing applications of the different types of products.

* * *

E. F. Houghton & Co., Philadephia, Pa., recently issued a new 148-page bulletin, "Vim Short Center Drives," showing their line of belt drives in capacities from 5 to 100 horsepower. It discusses especially Vim mineral tanned leather belting.

It is stated that the booklet was first prepared for the company's technical field men as an aid to the solution of field problems relating to installations. It contains a number of charts, tables of engineering and mathematical data. Announcement states that copies will be delivered by a company distributor direct to executives or engineers interested in transmissions who will write for it, or will send in their company letterhead.

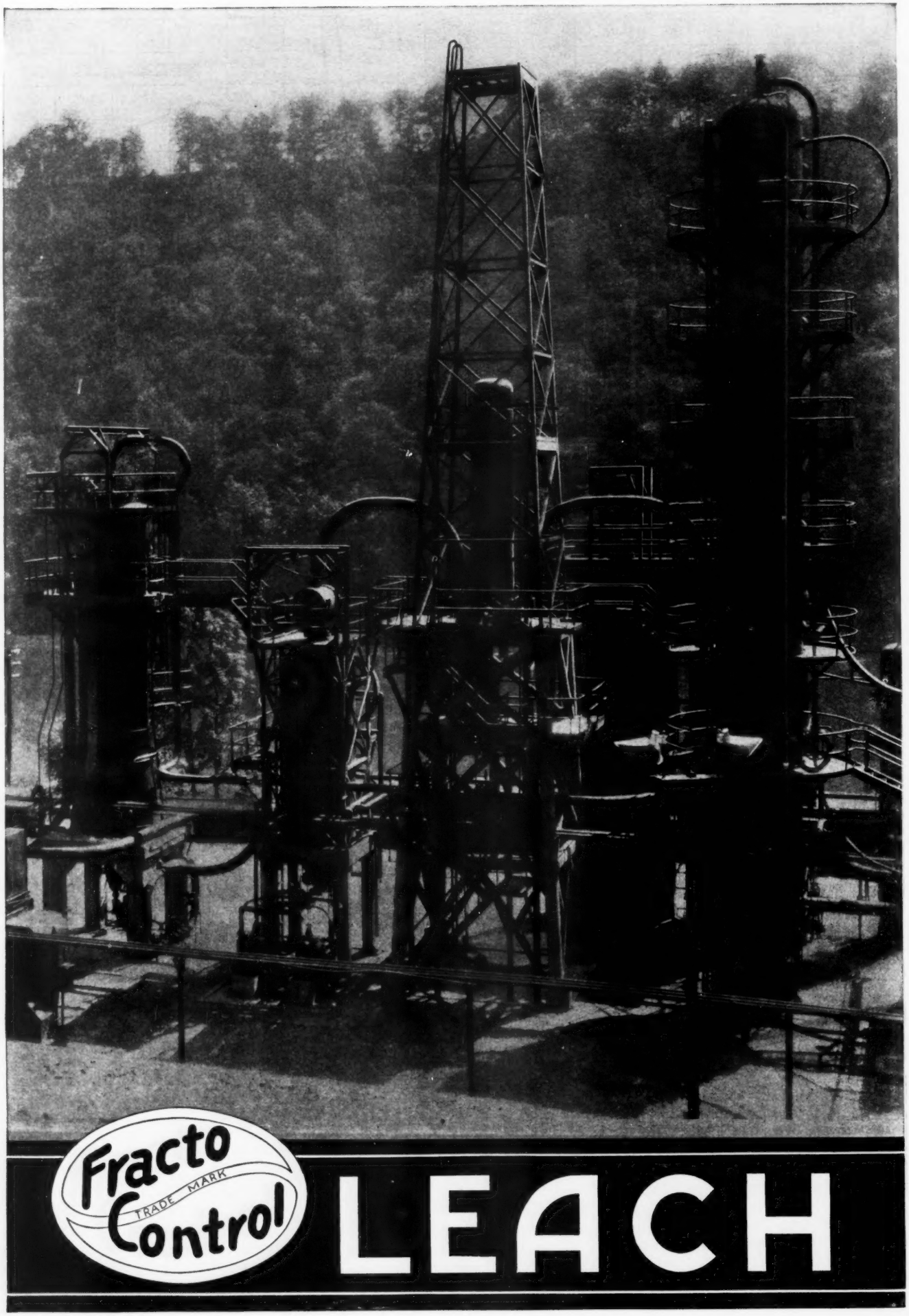
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Fig. 1—Installation of pre-drilled curved pipe on high pressure de Florez cracking still, showing location and spacing of safety holes

New Pre-Drilling Method Safeguards High Pressure Equipment

by

Luis de Florez*

PRE-drilling high pressure tubes, chambers and other cracking equipment so as to give warning of impending failure through corrosion or erosion as explained in this article has been under observation under severe operating conditions for a long period. The method is published only after the author and his associates are convinced that it is a successful method, proven by seven instances where failures have been avoided with the resultant explosions, fires, and possible loss of life.

The author makes the announcement that all proceeds which may accrue from the sale or license of this safety method will be utilized for the collection of safety statistics, data, and to promote safety in industrial work. It is understood that only nominal fees will be charged.

One point especially concerns the inventor of the method—that the plan may be used by persons unacquainted with the engineering principles involved, and carried out in such a way that danger may result from its improper application. "This method is not to be considered as a substitute for customary precautionary or inspection methods," Mr. deFlorez states.... "It is to be used as an additional measure for safety to life and property, to supplement the inspections now employed by every refiner. Employment of the idea by refiners before they are thoroughly acquainted with its principles and the proper manner of drilling, spacing, etc., may easily result in defeating the purpose of it. Too great reliance on the plan to the exclusion of all other safety measures should not be permitted."

THE processing of petroleum oil under pressure and temperature has always been a hazardous operation. Perhaps the obvious danger heretofore has been its own safeguard, for it has led to rigid inspection methods, strict discipline, in addition to extreme care in processing.

From the standpoint of design and material, much progress has been made, but with the advent of corrosive charging stock, high velocities in conduits to inhibit carbon formation, and processing the less favorable stocks, even the best design and skillful choice of materials are not entirely adequate to insure safety and increased reliance must be placed in the added inspection and routine care.

We now know how to make runs of the order of 2000 hours in the case of cracking units, and improvements in processes permit the use of charging stocks which were formerly not considered favorable for cracking. Modern cracking units are often called upon to make a

*Consulting Chemical Engineer.

definite product from residual oils and heterogeneous refinery mixtures which may be highly corrosive.

The tendency seems to be, in fact, to make the function of cracking units one of general utility instead of a specialty operation on selected stocks as in former years, when cracking was limited to a comparatively small part of refinery operation. Today the tendency is to turn into gasoline anything that cannot be sold and the cracking units are called upon to perform this operation.

Since these conditions prevail and will, in all probability, continue along this trend, it is evident that methods must be developed to supplement the usual inspection and drilling of vessels and conduits to offset conditions which are constantly becoming more severe.

The purpose of this article is to describe such a method, now in successful use, which has materially reduced the hazard of failure on pressure stills. The method, which appears to be simple and comparatively inexpensive, has been developed after much though and effort, and is now widely used by several of the large oil companies who have largely contributed to its development. The general idea is simple, as will be seen, but experience shows that proper technique is necessary and improper use may destroy its usefulness.

The method consists essentially of preparing small spots in conduits or vessels where failure may occur harmlessly but giving indication of wear while there is still sufficient metal to operate with safety until such time as the plant may be shut down.

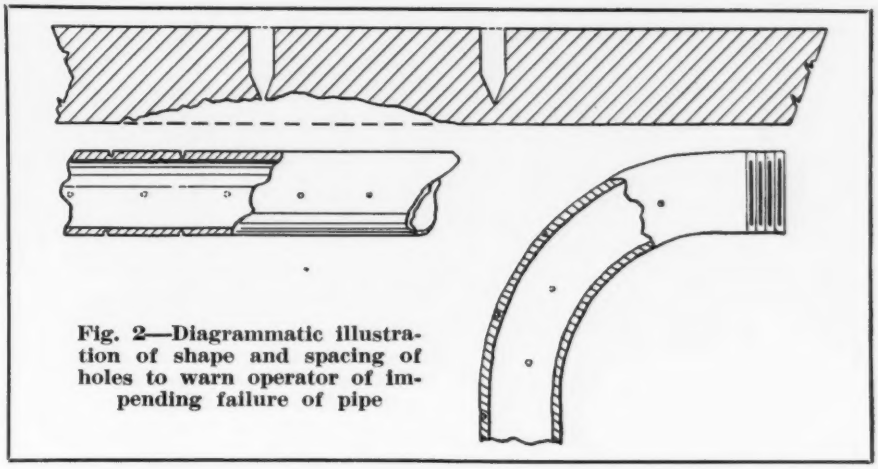


Fig. 2—Diagrammatic illustration of shape and spacing of holes to warn operator of impending failure of pipe

This is accomplished by drilling the walls of the equipment with small holes at fairly close intervals to a depth determined by the lowest safe bursting limit. When corrosion or erosion occur to thin the wall of the container, leakage will be evidenced at these drilled points giving warning that a safety limit has been reached.

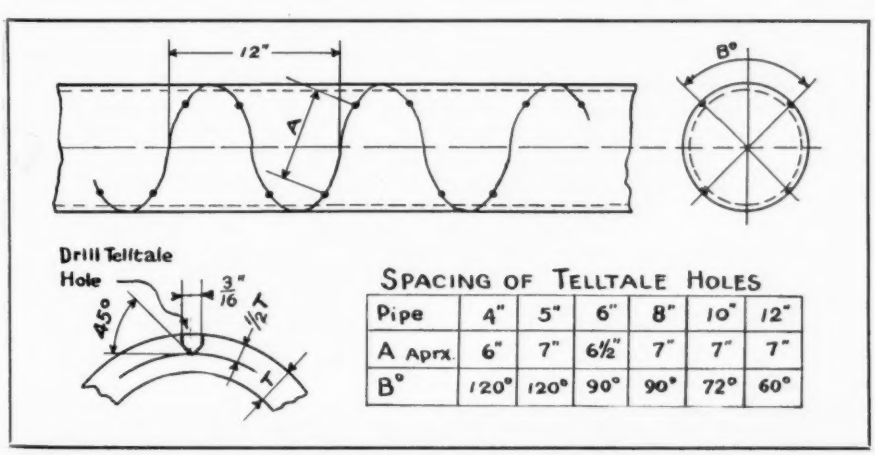
The size and shape of the holes and their position and number are of great importance and have been the subject of a great deal of study and will continue to be, as usage furnishes experience.

It has been found that the most satisfactory shape for the hole is cylindrical with a sharp conical bottom, the size of the cylinder being ⅛ inch to ¼ inch in diameter and the angle of the cone 45 degrees to 60 degrees with the horizontal. The conical bottom of this hole permits the leakage to take place when the metal wears away at the minimum rate at first, gradually increasing to the full bore of the hole if, by any chance, it is not observed with reasonable promptness.

The increasing diameter of the hole insures the dislodging of any obstruction which may form which might interfere with the leakage. The holes are drilled through the metal until the point of the cone reaches the predetermined safety line, usually one half of the thickness of the original wall, the depth being regulated by a stop on a drill which has been shaped to the desired cone bottom.

The spacing of the holes around the conduit has been a matter of discussion and it has been generally conceded that where there is a possibility of spotty corrosion the only safe course lies in drilling the tube at regular intervals around its periphery and not attempting to drill only in the spot where corrosion is most likely. Several instances have indicated that mistakes might be made in assuming the point of maximum corrosion and the wearing of the walls progress to an unsafe degree without giving proper warning.

For instance, in one case, as shown by the accompanying photograph, the corrosion spot occurred at the beginning of the bend and not in the central portion. It has also been found



SPACING OF TELLTALE HOLES

Pipe	4"	5"	6"	8"	10"	12"
A Aprx.	6"	7"	6½"	7"	7"	7"
B°	120°	120°	90°	90°	72°	60°

Fig. 3—Arrangement of safety holes in pre-drilled pipe, and table of sizes and spacings

Fig. 4—Safety hole drilled in pipe bend, external view. Hole is not placed at center of bend

that in straight sections of pipe wear is observed just beyond the flanges, although the point of maximum wear may sometimes occur 30 inches or 40 inches from this point.

Just why corrosion spots occur is not entirely clear although it seems that they are generally caused by turbulence which wipes the surface clean and permits corrosion to become more effective in this locality. Uneven composition of metal or surface, which is also undoubtedly a factor, cannot, as a rule, be detected in pipe inspection, and makes it necessary to drill according to pattern rather than in accordance with logic.

In straight line pipe it is considered desirable to drill at regular intervals all around the pipe, usually at two points 180 degrees apart, the next two holes being drilled with their axes at right angles to the preceeding pair. The spacing between each pair of holes is made from 6 inches to 14 inches, which appears to cover the area of the pipe sufficiently for safety. There is no objection to putting the holes even closer, but the above spacing seems to be adequate and not unreasonable.

It is obviously a tedious matter to drill pipe in the fields with accurate holes, particularly when, as in many instances, scaffolding is required and the unit must be shut down for the operation. Where it is necessary, of course, this may be done and the spacing modified to suit conditions.

In order to obviate this difficulty and expense, provisions have been made to supply predrilled pipe and tubing in regular lengths which can be substituted for regular pipe on all important lines. The use of this pipe on new work will provide the necessary safety at very little additional cost.

In the case of bends, it is felt that predrilled pipe may be used in spite of the fact that some distortion of the holes will occur. The necessity for a large number of drillings in any system of piping is essential to safety and as long as the distortion of the holes does not preclude their proper functioning it is felt that the reduction in labor insures the requisite number of drillings and minimizes the tendency to wide spacing to save cost, which may not completely safeguard the system.

The use of drillings has also been extended to still tubing within the furnace. It is particularly valuable in indicating the thinning of tubes toward the ends where this usually occurs to the greatest extent and thus gives an indication of the strength of the rollings in the header boxes. Many instances have occurred where tubes have become so thin at the ends that the rolled portion in making the joint with the return bend has

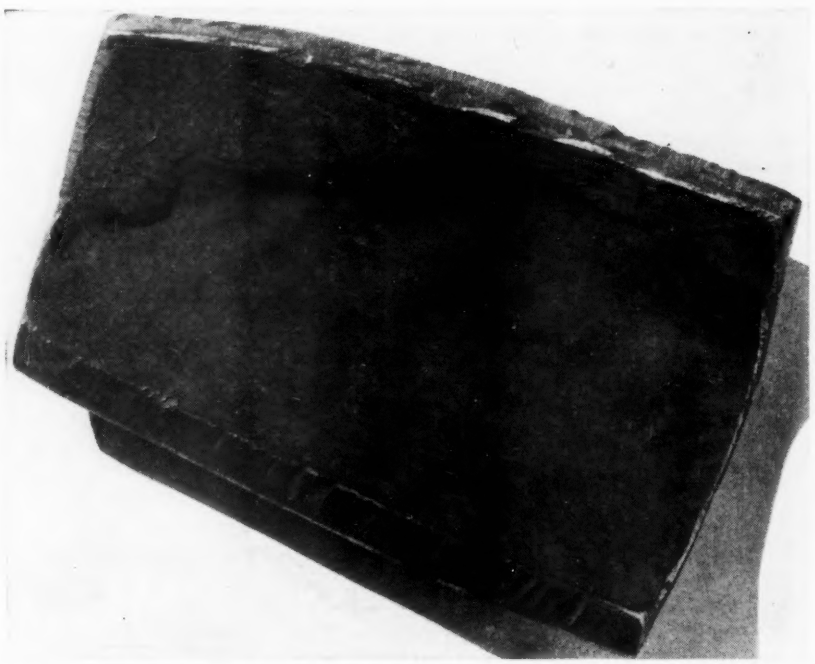


Fig. 5—Tapered point of safety hole uncovered by corrosion and erosion of inner wall of pipe shown in Fig. 4. Vapors escaping from this hole tells of threatened danger. Note in upper left the "cliff" formed by wearing away metal, which shows the relative amount of pipe wall which has disappeared

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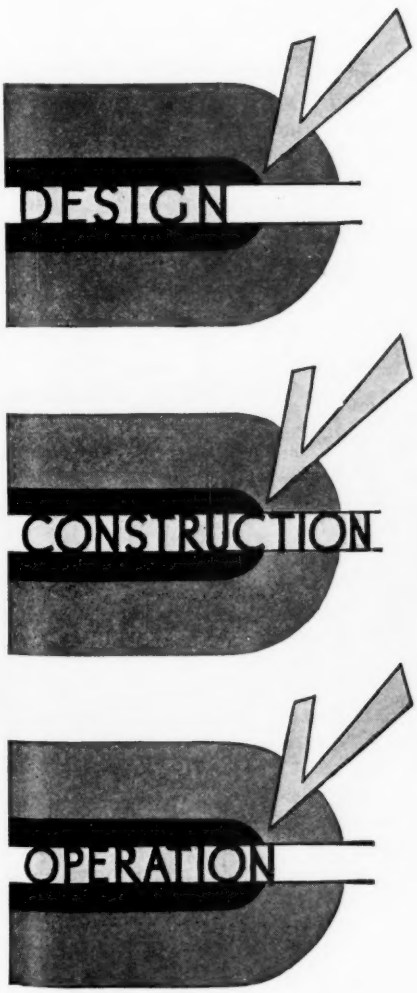

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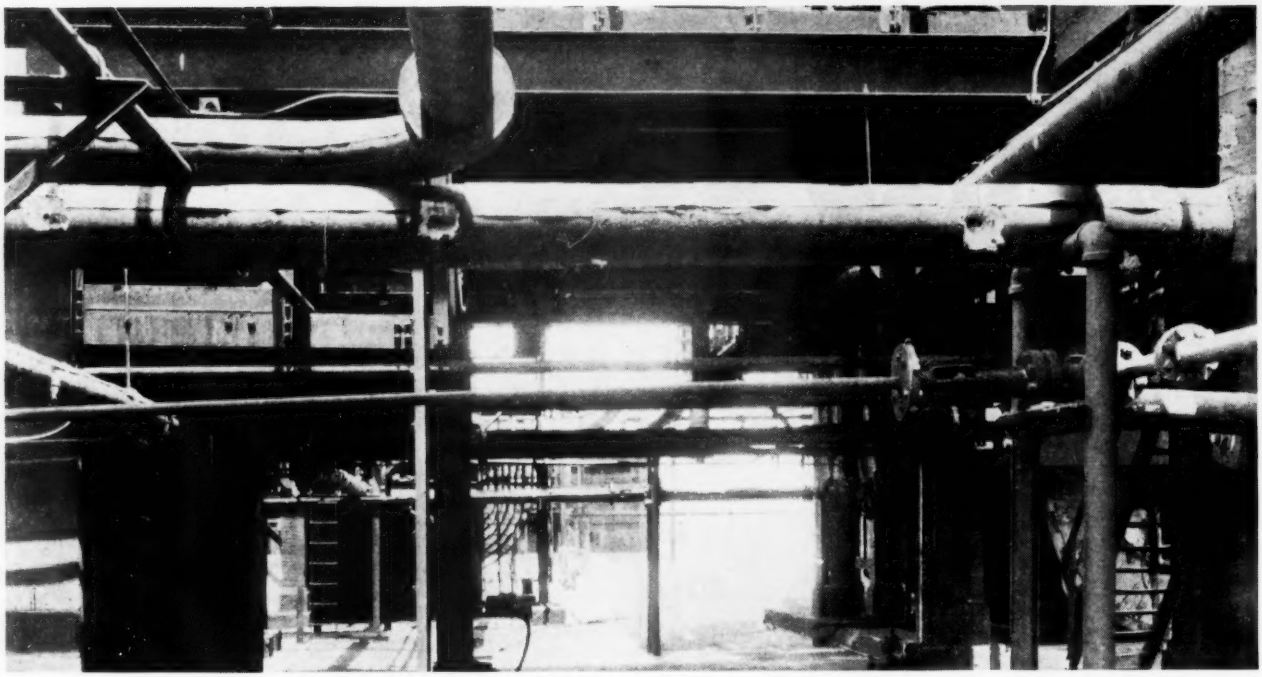

Fig. 6—Spacing of holes in straight section of high pressure pipe. Lack of curvature, and the service to which pipe is subjected makes close spacing such as is shown in Fig. 1 unnecessary

collapsed, blowing off the header, which always results in a serious fire. Drilling the tubes a foot or two inside the headers would give an indication long before the danger point would be reached.

Tubes, however, do not always wear at the ends and, again, there are sufficient instances of thinning of the walls in the center section to make it worth while drilling the whole tube although the spacings may be made larger than in transfer lines or vapor lines.

It seems to be the opinion of a number of operators, including the writer, that if holes are provided in the tube, where a swelling occurs, a pin hole failure will be evidenced at the drilling before the pipe swells sufficiently to split which would be obviously advantageous.

The question of the effect of the drilling described on the strength of tubing in conduits has, of course, arisen and it seems evident from study that on piping of any size which might be used for refinery equipment, the holes do not materially effect the strength due to any tendency of localizing stresses. The actual amount of metal removed from the wall of the pipe is only a fraction of a per cent of the total and from an arithmetical point of view is negligible. For instance, even if holes should be placed as close as 4 inches apart on a 4-inch pipe, the area of four ⅛-inch holes, which is 0.049 square inch in comparison with 54 square inches, is obviously negligible even though no account is taken of the metal between the bottom of the hole and the inside of the pipe which, of course, has not been removed.

A factor which has to be taken into account in actual operation is the method of insuring that the leakage between holes can be observed with insulated lines. This can be accomplished in a number of different ways. Where comparatively few holes are used, a small piece of tubing may be tack welded on the pipe and extended through the insulation. The insulation may be put on in the usual way, breaking it up into sections of 6 feet to 8 feet in length, separating these by tin dams. In the latter case, if a leak occurs, the insulation will become impregnated with oil and show up, either from smoke or dripping, in sufficient time to permit the equipment to be shut down. Other methods have also been devised, the problem being simplified since ample time is available to notice failures before the ultimate danger point of the conduit is reached.

It will be evident that in the past the idea of using fusible links or safety plugs to act as a warning of dangerous conditions has been given recognition but up to the present nothing has been devised to safeguard piping and tubing, in the oil industry, and remove the enormous hazard of failures in conduits under increasingly difficult duty.

If we analyze the cracking still installation, or in fact any distillation equipment, we will realize the immense amount of piping involved and the corresponding necessity of avoiding failures to protect the lives of operators, to say nothing of equipment. The use of such devices as screw plugs or even periodic drilling is evidently inadequate and it seems evident that the only real safeguard can exist in some method which can be applied indiscriminately along the whole length of important conduits without weakening the structure and at reasonable cost.

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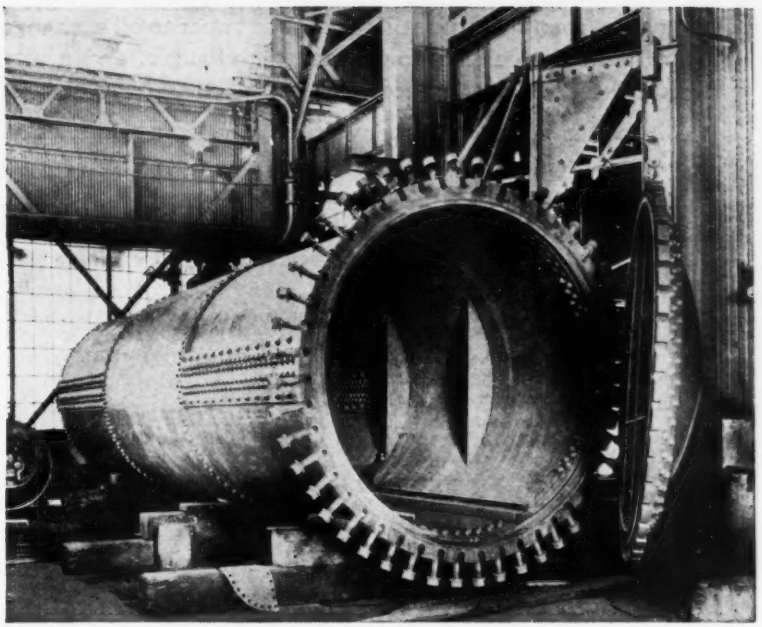
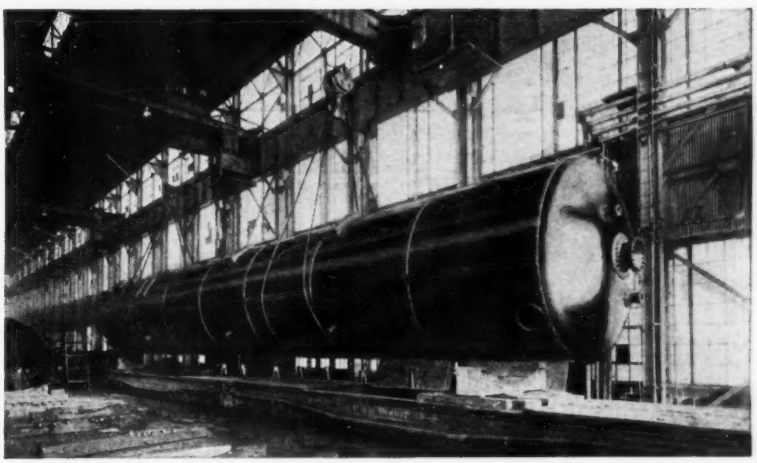


IMPREGNATOR SHELL



TOWER—13' 4" DIAMETER x 95' HIGH—WEIGHT 250,000 LBS.
HANDLED AND SHIPPED IN ONE PIECE

SUN SHIPBUILDING & DRY DOCK CO., Chester, Pa.

Condensing—cooling—heat recovery
with G-R Apparatus

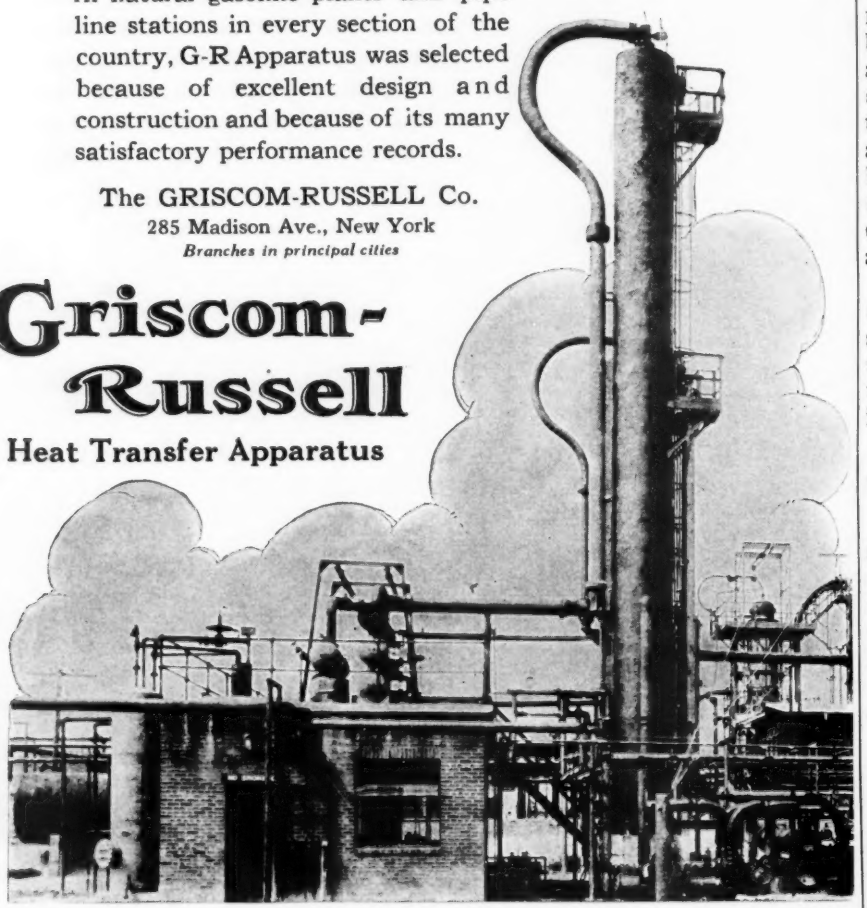
THE illustration shows a modern refining unit in which G-R Apparatus is assuring maximum effectiveness of heat transfer operations.

The G-R Units at this plant include a two-section condenser for the gasoline vapor from the topping plant, another two-section water cooled condenser for the gasoline vapor from the rerun still, a gasoline vapor to oil exchanger, a crude bottoms to crude charge exchanger, and a rerun distillate charge preheater.

In this plant, as in many other petroleum refineries and in natural gasoline plants and pipe line stations in every section of the country, G-R Apparatus was selected because of excellent design and construction and because of its many satisfactory performance records.

The GRISCOM-RUSSELL Co.
285 Madison Ave., New York
Branches in principal cities

Griscom-Russell
Heat Transfer Apparatus



BETHLEHEM
WAX PLANT EQUIPMENT

Filter Presses — *Wax Moulding Presses*
Wax Distillate Chilling Machines — *Scale Wax Cooling Drums*
Wax Testing Presses — *Paraffine Wax Sweater Plants*
Complete Wax Plants designed and built
Stills, Towers, Condensers, and other Oil Refinery Equipment
Oil Burning Systems

BETHLEHEM STEEL COMPANY, *General Offices: Bethlehem, Pa.*

District Offices: New York, Boston, Philadelphia, Baltimore, Washington, Atlanta, Pittsburgh, Buffalo, Cleveland, Cincinnati, Detroit, Chicago, St. Louis

Pacific Coast Distributor:
Pacific Coast Steel Corporation
San Francisco, Los Angeles, Portland, Seattle, Honolulu

the writer has had occasion to witness, in many instances, the effect of spotty corrosion, the erratic nature of which, coupled with the evident hazard and destruction caused by failures, have led to the development described. A good illustration of a dangerous corrosion spot is shown in the accompanying photograph (Fig. 5) where the drilled hole indicated a pending failure. The sample was cut from a piece of 6 inch diameter pipe which had been in operation about 6000 hours. The spot occurred on the outer wall of the bend but not in the center of the sweep where the metal probably would have been drilled for inspection. As a matter of fact, at the center of the bend the metal was virtually unaffected. A serious accident was probably averted by the use of the drilling and up to date there are seven recorded instances of this nature at hand.

Work is now in progress on accumulating data on best standards for size of holes and spacing and the application of the method to facilitate its being put into practice.

World's Tallest Steel Derrick

LOS ANGELES—The tallest steel derrick in the world was recently erected for the Superior Oil Co., at Ventura, Cal., by the International-Derrick & Equipment Division of the International-Stacey Corporation of California.

Before erecting this derrick it was necessary to cut away a portion of the mountain side to secure a site. The derrick is a re-enforced 178-foot silicon steel derrick with a 32-foot square steel base and is mounted upon a steel base substructure instead of the customary wooden underpinning. The steel was erected in two days.

Soft Coal Sessions Open to Public

PITTSBURGH, Nov. 5.—Sessions of the Third International Conference on Bituminous Coal, to be held Nov. 16 to 21 at Pittsburgh, under the auspices of Carnegie Institute of Technology, will be open to the public. Two sections of the meeting will be devoted to hydrogenation and liquefaction.

Operators Planning Unit Development and Wide Spacing in Western Kansas

By Lawrence E. Smith
N. P. N. STAFF WRITER

WICHITA, Kans.

IN THE several public hearings on control of production held this year, considerable attention was given to a western Kansas area by the assertions of public officials of the state there are numerous pools completely shut-in.

It is not generally realized that an area has been proved for production in Rice and Ellsworth counties that is about 30 miles from north to south. This must be qualified by saying that the strip probably will consist of several pools, rather than one of continuous production.

Neither is it generally known that much work has been done quietly in this region looking toward the development when warranted on basis that will permit of profits. Such planning includes the formation of unit development acreage blocks and revision of the customary policy of drilling one well to each 10 acres.

A group of the larger lessees are now at work trying to obtain general approval of a drilling program of one well to 40 acres. They report that considerable progress has been made. There are some who favor a spacing of nine wells to the 160 acres. On this basis, wells would be 880 feet apart, instead of 660 under the 10-acre spacing and 2640 feet, a half mile, under the 40-acre spacing.

Whatever is finally decided upon—and the program may vary in different parts of the area—it is now virtually assured that the old 10-acre spacing will not be followed. The arguments are too sound for wider spacing and the leases are so thoroughly in the hands of operators who make their money from the oil produced and not from sales of stock, that uneconomic drilling will not be done. The principal producing formation in the Rice-Ellsworth area is the Siliceous lime and, like all lime formations, the agency that will move the oil into the wells is water. In this area, the lime is highly porous and early indications are that the natural water drive, which will begin with the withdrawal of oil, will be of sufficient force under wide spacing to flush the pay formation of nearly as much of its original content as would result from close drilling. The chief difference would be in the time required to effect the recovery.

Wells will cost, completed, between $30,000 and $35,000. Estimates vary as to what can be expected in number of barrels per acre. They range from 7500 to 12,000. Leaders in the move to drill one well to each 40 acres incline to base calculations on 8000 barrels. They estimate lifting costs over the life of the field to be 25 cents.

On the basis of these factors, the realization at 70 cents per barrel for the oil would be as follows, the latter figure, it is sincerely hoped, erring on the conservative side, but being the price at this time:

Recovery @ 8000 bbls. per acre, 40-Acre spacing, bbls.	320,000
Cost of drilling one well	$35,000
Lifting cost @ 25 cts. on 320,000 bbls.	$80,000
Total cost	$115,000
Total income @ 70 cents per bbl.	$224,000
Less one-eighth royalty	28,000
Income from working interest	$196,000
Profit, operator's income less development and producing expense	$81,000

On the same basis, but drilling one well to 10 acres, there would be a loss of $24,000.

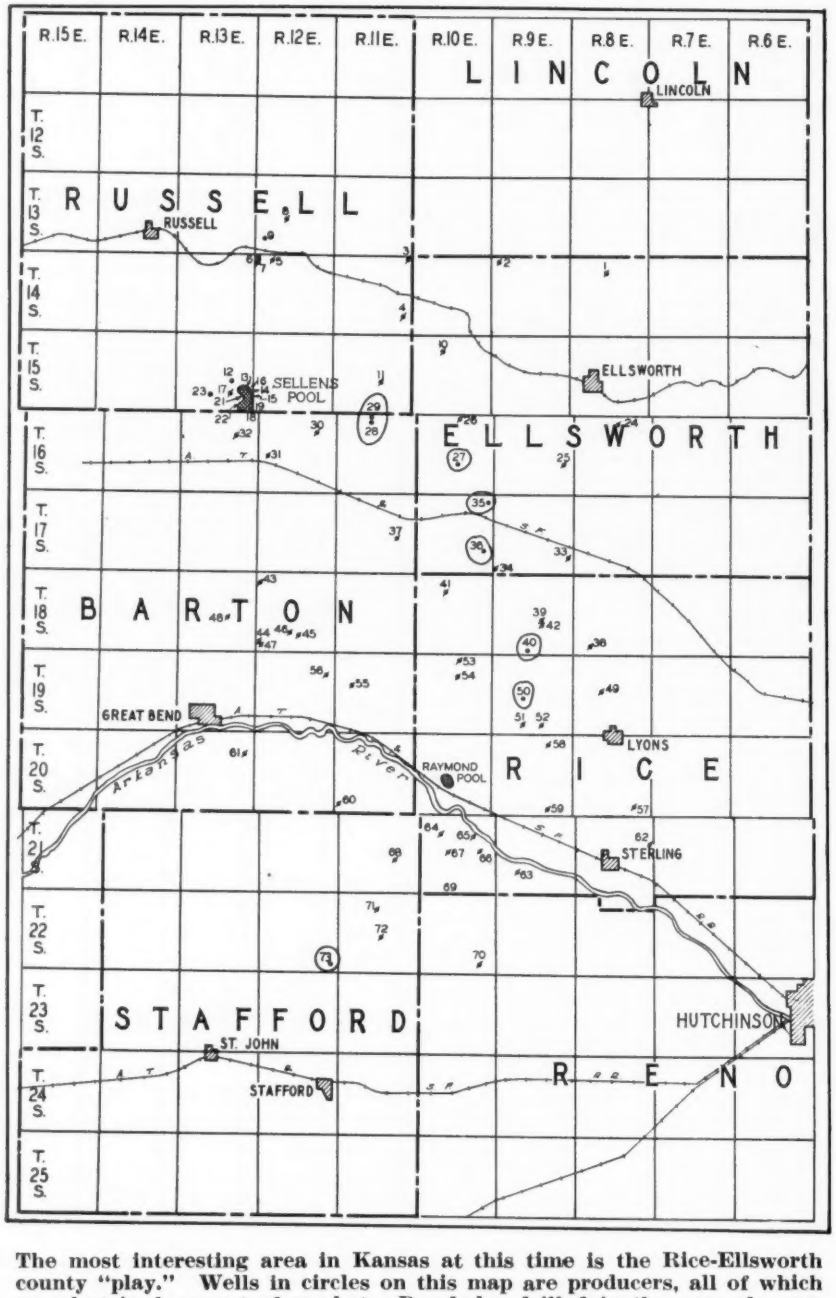
Assuming that the recovery on a 40-acre spacing would be but half what would be produced on the basis of one well to 10 acres, or 4000 barrels per acre, there would still be a profit of $23,000.

The most uncertain of the factors with which operators are dealing, in figuring how to realize a profit is that of acreage recovery. The method in use is to rely on the history of Siliceous lime pools elsewhere in Kansas.

On a map of the size published with this article it is not possible to indicate the blocks of acreage that are held. The practice of taking large tracts under lease instead of the time honored "checkerboarding" got its big start in western Kansas several years ago. Many of the blocks were leased because core drilling had revealed favorable structure and others were taken on the familiar "protection" basis. Whatever the reason, nearly every major company and many of those of lesser rank, as well as individual operators, preferred to hold their acreage in compact form rather than to scatter their bets in the form of 80 and 160-acre tracts over several townships.

The result is that when development begins, it will be on a basis where much of the drilling ordinarily called for can be deferred until the operator who owns the big block gets around to it in the orderly course of his development program.

THERE has been much effort expended in getting operators to pool their holdings to form large unit blocks. Typical of this is the part that has been played by J. H. Tatlock, of Wichita, who in 1929 set up the first two unit development projects in Kansas. He has handled through direct taking of leases and their subsequent disposal or retention by himself,



The most interesting area in Kansas at this time is the Rice-Ellsworth county "play." Wells in circles on this map are producers, all of which are shut in for want of market. Dry holes drilled in the area also are shown

more than 250,000 acres in western Kansas.

His plan generally has been to sell undivided interests in the entire block. Those who purchased the interests then entered into a unit operating agreement, of the type that has come to be familiar in the Mid-Continent, under which each operator shares in the expense in proportion to the interest he holds. The net revenue from production, when obtained, is shared in the same manner. One of the group members is selected as the operator of the whole property.

On the A and B blocks, each consisting of 10,240 acres, the interests were sold on the basis of a completed well, to be drilled by Mr. Tatlock. The agreements were as of Aug. 27, 1929. On the A block, which is a rectangle lying in Twps. 17-8, 17-9 and 18-8, 18-9, the well was dry. It does not condemn all of the block and the agreement continues in force. All leases were written on 10-year basis and those in the A block, like the rest, have seven and eight years to run.

In this block, the division of ownership in the whole is as follows: J. H. Tatlock, one-eighth; Carter Oil Co., one-fourth; Empire Oil & Refining Co., one-fourth; Shell Petroleum Corp., one-fourth and the J. A. Hull Oil Co., one-eighth. Carter Oil Co. is to be the operator of the block, at such time as it is decided expedient to conduct further drilling.

On the B block, which also called for a completed well, there was a better turn of events, for the well drilled by Mr. Tatlock proved to be one of the best ever completed in western Kansas. This well, No. 1 Ploog, in the center of the southwest of the southeast of 33-18-9W, found production in the Siliceous lime at 3249-53 feet. Its best swabbing record was 205 barrels per hour and, when shut in was flowing 30 barrels per hour through eight-inch casing.

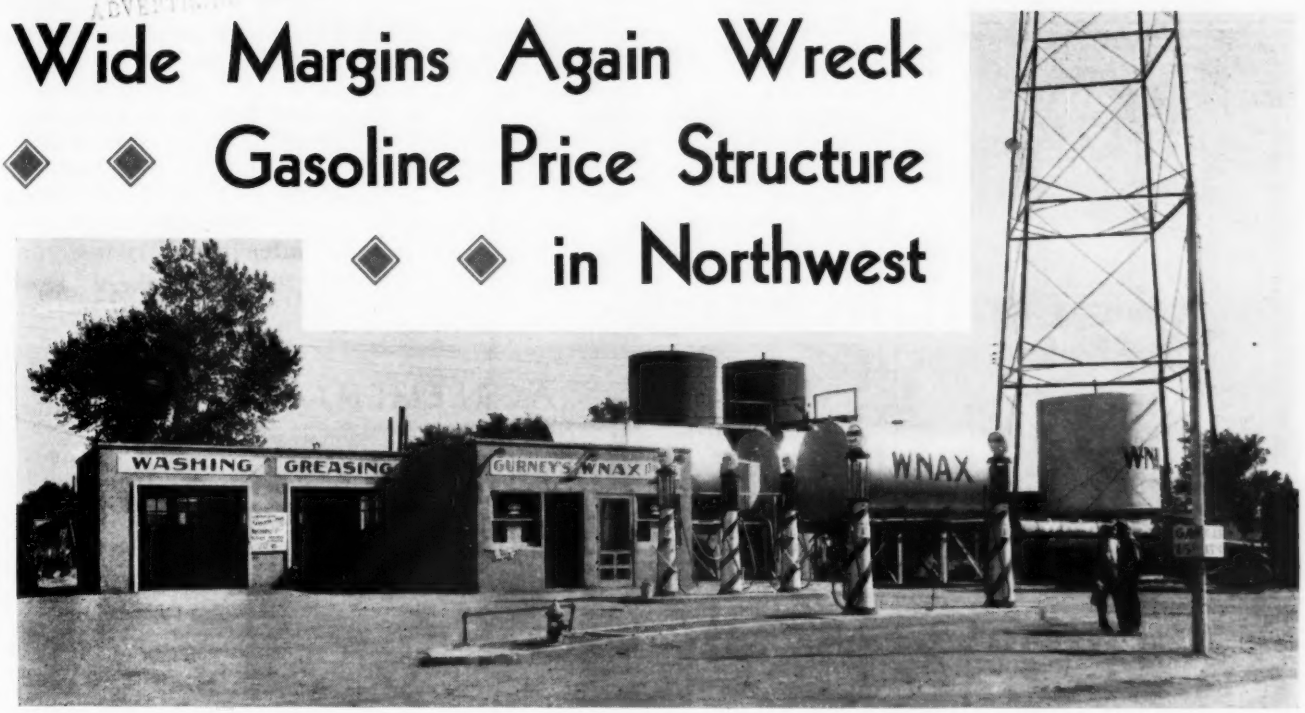
This well is an important one and, under usual conditions, would have meant an immediate drilling campaign. The fact it is well inside a large acreage block was not sufficient to stop such drilling, for diverse ownership of the land would necessitate drilling if the first well were put on production.

There occurred one of those unusual things that point the way to control of a new area. The owner of the land on which the discovery well of this block was drilled, Mr. Ploog, signed an agreement on July 8, last, formalizing a verbal agreement made earlier. By the terms of this contract, the well was to remain shut in until the price is at least $1 a barrel at the well. In consideration, the block owners agreed to pay the taxes on the land and to pay rentals up to the time the well goes on production. This agreement has also been signed by those who bought royalty interests in the Ploog farm on which the well was drilled.

Prepare for Exposition

LOS ANGELES — Preparations are being made here for the third annual Oil Equipment and Engineering Exposition to be held Feb. 1 to 7, 1932, at the permanent exposition grounds at 131st and Alameda Blvd. The organization has been incorporated under the name of International Industrial Expositions, Ltd., with E. G. Lenzner as president and general manager.

Wide Margins Again Wreck Gasoline Price Structure in Northwest



Gurney's bulk plant and first service station at Yankton, S. D. The steel column at right is the lower part of one of the WNAX aerial standards. Three grades of gasoline are sold at this station, the most substantial of the Gurney set-up in Yankton. Pumps are aluminum coated with green strips

YANKTON, S. D.

By Roger B. Stafford
N. P. N. STAFF WRITER

WIDE margins have upset the gasoline price structure again in the northwest, just as they put the state of South Dakota in the gasoline business in 1923, when W. H. McMaster was governor. Radio has played a big part in the present wave of low gasoline prices. Oils are included in the disturbance. Gasoline prices have been cut 3 to 7 cents a gallon.

In the last 15 months a chain of approximately 500 cut price filling stations has sprung up in South Dakota, North Dakota, southern Minnesota, western Iowa, northeastern Nebraska and eastern Wyoming. The chain is sponsored by the House of Gurney, Inc., of Yankton, owner of radio station WNAX. The filling stations are operated as WNAX stations.

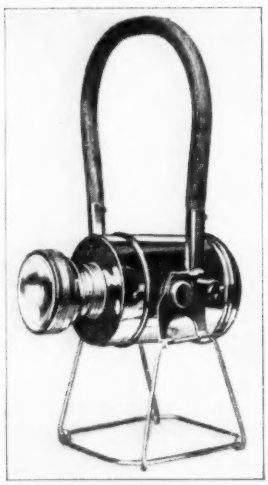
The House of Gurney, formerly styled the Gurney Seed & Nursery Co., has been in the seed and nursery business 40 years in Yankton. It also operates a mail order business in general merchandise in competition in a small way with the Chicago mail order houses, and a retail store in connection with its radio station.

The company is headed by D. B. Gurney, son of the founder. D. B. Gurney came to Yankton 40 years ago to establish a branch for the seed and nursery business which then had headquarters in Monticello, Iowa. He was a good mixer. He studied the problems of the northwestern farmers. Seeing it was good business he helped fight their battles. Being an opportunist he undertook to provide lower prices for the goods farmers bought at a time that the market value of their products was falling.

Gurney first embarked in cut

Gross Margins Between Cost of Gasoline Laid Down and Service Station Prices in WNAX Territory

1931	Mankato, Minn. Cents per Gallon	Sioux City, Iowa Cents per Gallon	Fargo, N. D. Cents per Gallon	Pierre, S. D. Cents per Gallon	Huron, S. D. Cents per Gallon	Norfolk, Neb. Cents per Gallon
Oct. 5	6.175	5.595	6.635	4.885	5.905	7.025
Sept. 1	4.1125	3.5325	4.5725	2.8225	3.8425	4.9625
Aug. 3	5.925	5.345	6.385	4.635	5.655	6.775
July 6	6.4875	5.9075	6.9475	5.1975	6.2175	7.3375
June 1	6.425	5.845	6.885	5.135	6.155	7.275
May 4	5.9912	5.4112	6.4512	4.7012	6.7212	6.8412
April 6	6.45	3.97	5.11	4.26	6.28	6.90
March 2	8.30	7.72	5.86	7.01	6.23	6.65
Feb. 2	7.50	7.22	8.26	6.51	5.73	6.15
Jan. 5	7.925	7.345	8.385	6.635	7.655	6.275
1930						
Dec. 1	3.45	5.77	8.01	6.26	5.48	5.90
Nov. 3	3.20	5.52	7.76	6.01	5.23	5.65
Oct. 6	6.45	4.77	7.01	5.26	4.48	4.90
Sept. 2	8.25	7.67	8.71	6.96	4.18	9.10
Aug. 4	8.05	7.47	8.51	6.76	7.78	8.90
July 7	7.8417	7.2617	8.3017	6.5517	7.5717	8.6917
June 2	7.4690	6.8896	7.9296	6.1796	7.1996	8.3196
May 5	6.9389	6.3589	7.3989	5.6489	6.6689	7.7889
April 7	6.5639	5.9839	7.0239	5.2739	6.2939	7.4139
March 3	6.8285	6.2485	7.2885	5.5385	6.5585	7.6785
Feb. 3	8.672	8.092	9.132	7.382	8.402	9.522
Jan. 6	8.4091	7.8291	8.8691	7.1191	8.1391	9.2591
1929						
Dec. 2	8.0781	7.4981	8.5381	6.7881	7.8081	8.9281
Nov. 4	7.8236	7.2436	8.2836	6.5336	7.5536	8.6736
Oct. 7	7.617	7.037	8.077	6.327	7.347	8.467
Sept. 2	7.5728	6.9928	8.0328	6.2828	7.3028	8.4228
Aug. 5	7.8511	7.2711	8.3111	6.5611	7.5811	8.7011



BRONSON
ELECTRIC LANTERN

AT NIGHT . . . .

For tank gauging . . . . checking sight and pressure gauges . . . . for car unloading . . . . for working *safely* . . . . use a Bronson Electric Lantern.

Write for prices

E. B. BRONSON & CO.
Machinists — Contractors
Blue Island, Illinois

Special Muleskin Folio

Your Name in Gold FREE

Complete Net $7.50

862K—Special made folio from heavy double weight muleskin in handsome shark grain. Has three pockets, heavy leather straps and handle, gold lock, bottom reinforced with steel studs. Inner case contains six 4-oz. bottles, partitioned separately, lined with red velvet. Metal capped corks furnished. Case also contains five grease jars.

Other styles in our FREE Catalog

L-U-C-E

Builders of Sales Luggage

614 Delaware, Kansas City, Mo.

prices in his own line—seeds. He offered "bargain seeds" and thereby stirred up the opposition of his competitors. In 1927 he bought the radio station and since has had an effective weapon to wield against those that opposed him. His station dominates the northwestern agricultural territory and so far no other station in the northwest has been able to get as large an audience for its broadcasts as WNAX has obtained, it is conceded by major and Independent oil men in that region.

Gurney turned his attention to gasoline and oils in midsummer, 1930. He announced in a daily broadcast in July last year that he would open a fair price filling station in Yankton. He

AGREEMENT

This agreement made and executed and delivered at ..... this ..... day of ....., 1931, by and between Gurney Seed and Nursery Company, of Yankton, S. D., a Corporation or its successors and assigns, hereinafter named as the Company, and ..... of ..... and their successors, administrators, executors or assigns hereinafter known as the Vendor.

WITNESSETH:—In consideration of the mutual benefit to be derived through the execution of this instrument, the Company and the Vendor jointly and severally agree to the following:—

The Company agrees to purchase for the account of the Vendor at cost to the Company, all petroleum products of quality, approved by the State. The Vendor may purchase through or from the Company all radio and auto accessories such as may be handled for resale, and the Company agrees to purchase said accessories for the account of the Vendor at cost to the Company.

The Company agrees to use its large purchasing power for the benefit of the Vendor, the above merchandise to be paid for in cash by Vendor at time of delivery, during the time of this agreement, it being understood that the Company will use due diligence in making such purchases, but the Company will not be responsible for quality or specific delivery. The Vendor may purchase any additional petroleum handling equipment through the Company and the Company agrees to deliver same to the Vendor at their cost.

The Company agrees to broadcast daily except Sundays and holidays or at the election of the Company, suitable advertising over Radio Station WNAX at Yankton, S. D. concerning the Vendor's petroleum products business, such advertising being subject to the regulations of the Federal Radio Commission. For this advertising the Vendor agrees to pay the Company on the following basis for all petroleum products purchased for resale by the Vendor.

Gasoline or motor fuel, ¾ cent per gallon
Kerosine, ½ cent per gallon
Distillate, ½ cent per gallon
Lubricating oils, 4c per gallon
Greases and other lubricants 1c per pound
Auto and radio accessories 5% of cost to Company

It is agreed that the premises of the Vendor described hereinafter or any other which he may now own or control or operate, or any acquired during the life of this agreement which are in any way used for the storage or marketing of petoleum products are subject to the benefits of this agreement. The Vendor will forfeit the continuance of this agreement should he sell, assign or in any way dispose of such properties, all or in part, without the consent of the Company. In event of such disposal by the Vendor without the approval of the Company, it shall be considered that the Company has fulfilled its agreement entirely and payments will become due for the entire period based upon average payments made during the period of operation. This agreement shall be continuous and run for five years from date. Properties of the Vendor described below.

GURNEY SEED AND NURSERY COMPANY

Witness: By.....
..... Vendor.....
..... Approved:
Gurney Seed & Nursery Company
By.....
President
.....
Secretary

Copy of House of Gurney agreement in force before the company style was changed to House of Gurney, Inc., late last year. The advertising fee on large gallonage has been reduced to ½ cent but remains at ¾ cent on small gallonage

attacked the major companies, particularly the Standard Oil Co. of Indiana. He urged Independent oil marketers to join him in his project to give the people of the northwest cheaper gasoline and oil. Few joined him so he began to build a chain which has grown fast and profitable.

The company is collecting ½ cent a gallon on gasoline from affiliated stations that sell four carloads or more of gasoline a month and ¾ cent a gallon on a movement of less than four carloads a month. The chain, which now includes about 120 bulk plants and four times as many retail outlets besides a scattered tank wagon service, is moving an average of 250 carloads of gasoline a month, D. B. Gurney told NATIONAL PETROLEUM NEWS. A "grapevine telegraph" report places his August sales at 400 carloads.

At the minimum ½ cent a gallon the company would receive $12,500 a month average for the radio broadcasting each day to keep farmers lined up for the chain, brokerage fee on the gasoline which the company buys under contract from the Bell Oil & Gas Co. of Tulsa, and is probable that most of the WNAX Fair Price station advertising in *Common Sense,* a monthly magazine the company began to publish last spring. It is probable that most of the WNAX affiliated stations pay the higher fee, which means larger income for Gurney.

The company has a relatively little expense above broadcasting costs in connection with this income. The fee and also gasoline taxes are included in a sight draft attached to bills of lading on shipments to WNAX dealers. An unaudited statement of the House of Gurney for the eight months ended May 31, 1931, showed net income of $134,900. These eight months were those in which gasoline consumption is relatively light. The early part of the period was when the chain was not nearly so extensive as it is today.

The company collects 4 cents a gallon on lubricating oils, ½ cent a gallon each on kerosine and distillate, and I cent a pound greases. The lubricating oils are 100 per cent Pennsylvania, being marketed under

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Compliments of Barnsdall

We desire at this time to express our appreciation for the co-operation and assistance rendered Mr. E. B. Reeser during his three terms as President of the American Petroleum Institute.

Barnsdall will continue to use its every effort toward working out a constructive program of improving the great Petroleum Industry, which we are confident is entering a period of permanent prosperity.

BARNSDALL

The World's* FIRST *Refiner

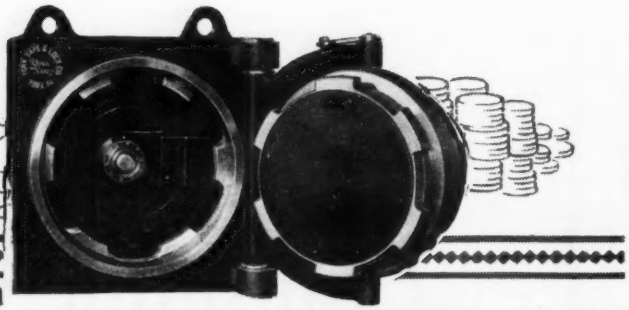
Gott Water Cans & Coolers

When you have a GOTT Water Cooler handy, you will always be assured of a fresh supply of pure drinking water kept delightfully cool. *Order one from your supply store.. now!*

Gotkool

H. P. GOTT MFG. CO. • Winfield, Kansas

KEEP PURE DRINKING WATER ALWAYS HANDY



BUILD BURGLAR PROTECTION *into* YOUR FILLING STATION

THE installation of a YORK Round Door Chest is so easy and economical that you cannot afford to be without this protection for your cash receipts. Anchored in a block of solid concrete, this sturdy little safe defies all menace of fire and theft. It cannot be removed from the building or attacked at any point except the heavy door. And that will stop any burglar.

When desired, the YORK Chest is also provided with the "Hold-up Partition" as illustrated. Provided with a slot for the insertion of money, this inner door may be kept closed and offers a disconcerting obstruction to bandits who attempt raids during business hours. The saving in burglary insurance alone will pay for a YORK Chest in a reasonable length of time.

Let us show you why so many companies, both large and small, have adopted them. Write for illustrated folder.

YORK SAFES

YORK SAFE & LOCK COMPANY
YORK, PENNSYLVANIA

MANUFACTURERS OF THE WORLD'S GREATEST VAULTS

"MERCHANDISING of PETROLEUM PRODUCTS"
by R. H. Thomas

Contains practical help for the oil salesman, agent, service station operator and particularly valuable to the man just starting in business.

The book is divided into five parts: 1—Helps for Agents; 2—Service Station Salesmen; 3—Oil Salesman and his Duties; 4—Complaints; 5—Questions and Answers.

It goes into methods of studying possibilities of your territory and making your own canvass of farm machinery on individual farms. How the agent and salesman can coordinate their efforts to develop new business and give the service that holds accounts. How the market for other products than gasoline and motor oil can be worked up. Selling through service stations. Handling of complaints and other marketing problems.

The author has had many years of actual experience in merchandising. His book gives you the benefit of his own experience as a successful marketer.

Send for your copy today. $2.50.

NATIONAL PETROLEUM NEWS, 1213 West Third St., Cleveland, Ohio

Permit No. 336 of the Pennsylvania Grade Crude Oil Association. They retail at 22½ cents by the quart and 20 cents a quart in crankcase fills. Gurney buys the oil from the Freedom Oil Works Co. and warehouses it in Yankton.

Only part of the stations are equipped to handle kerosine and distillate. Many of the bulk stations consist of one storage tank and small pumphouse. Tank wagon routes are operated out of a few of the plants but many are used only to serve the WNAX filling stations.

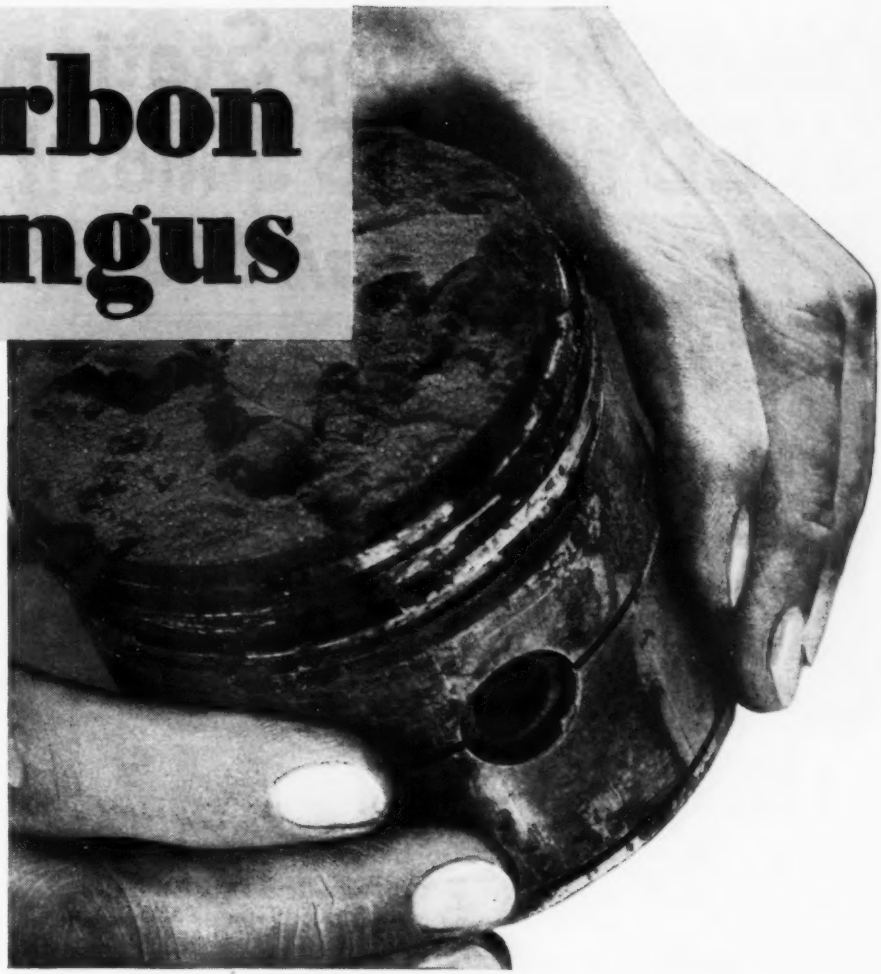
The House of Gurney owns only one bulk plant and three filling stations. All are in Yankton. The other stations are financed locally. Stations that joined the chain, had their own equipment, but the new outlets bought their equipment through the company.

Almost daily in his broadcasts from WNAX, D. B. Gurney solicits communities in which there is no WNAX filling station to petition him for the establishment of stations in such localities. He offers the aid of the company in getting them started.

When Gurney charged the oil industry was gouging the people of the northwest and announced he was going to sell them good gasoline at a lower price, the retail price in Yankton was 20.8 cents a gallon. There was a gross spread of about 7.75 cents between the cost of spot gasoline laid down in Yankton, including cost of gasoline in Group 3, freight, tax and inspection fee. The retail price was higher in relation to delivered cost than what one of the country's best marketing executives says can safely be made without drawing in cut price competition. This executive says a safe margin is around 6 cents a gallon.

Gurney's opening price was 17 cents, a cut of 3.8 cents a gallon. The opening was accompanied by much ballyhoo over the air. Some of the Independents were alarmed at the situation, remembering the effect that McMaster had had with the state-owned station at Mitchell, S. D., seven years before. The major companies watchfully waited and for their patience witnessed a mushroom

Carbon Fungus



A PARASITE FOUND IN 9 OUT OF 10 MOTORS

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Every turn a motor takes, it is fighting carbon . . . Carbon attacks, pits and burns valves . . . Carbon spoils intake and exhaust . . . Carbon crusts piston heads, upsets compression, causes "knocks."

Carbonized motors are slow motors, weak motors, troublesome motors, expensive motors . . . Sell VEEDOL Motor Oil and keep motors clean . . . Keep motors fast . . . Keep motors economical.

Sell VEEDOL Motor Oil, 99.1% free of carbon and carbon-bearing compounds. Sell VEEDOL Motor Oil, pure 100% Pennsylvania made 100% better by new refining equipment costing two million dollars.

VEEDOL leads all pure 100% Pennsylvania oils in its supreme quality. VEEDOL leads all pure 100% Pennsylvania oils in its non-premium price . . . *Sell* VEEDOL *Motor Oil.*

A TIDE WATER ASSOCIATED PRODUCT

100% PENNSYLVANIA
MADE 100% BETTER

SELL VEEDOL
ANTI-CARBON MOTOR OIL

Lubricates at 20° below Zero • 99.1% Carbon-Free

Jobbers . . . Dealers . . . What other motor oil offers you these advantages?

1. QUALITY . . . The highest viscosity index . . . the greatest fluidity at zero . . . 99.1% freedom from carbon . . . triple dewaxed . . . so clear you can read a newspaper through it.

2. PRICE . . . All of the new 100% Pennsylvania VEEDOL'S qualities are available to your customers without a price-premium.

3. ADVERTISING . . . More than $20,000,000 spent in past 15 years for VEEDOL advertising . . . New VEEDOL now being advertised with heavy schedules in national magazines . . . signs and dealer helps available without cost.

4. PROFIT . . . Tide Water jobber and dealer proposition on New VEEDOL so attractive substantial profits assured on oil alone . . . Plus extra gasoline business this nationally advertised line brings.

GENERAL SALES MANAGER
Tide Water Oil Sales Corp.
17 Battery Place, New York, N. Y.

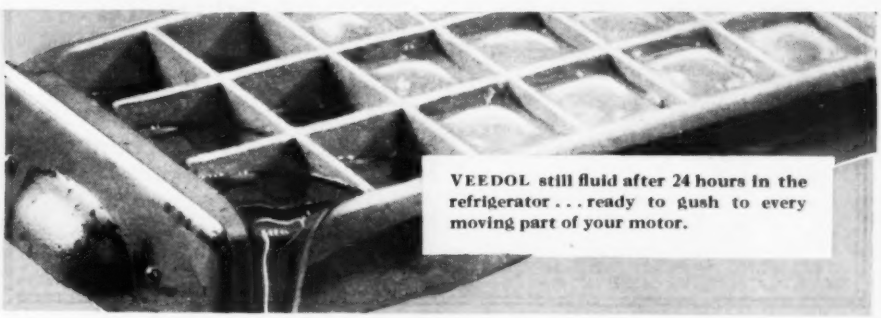
Dear Sir: We are interested in your jobber / dealer proposition.

Please have your representative call.

*Name*_____

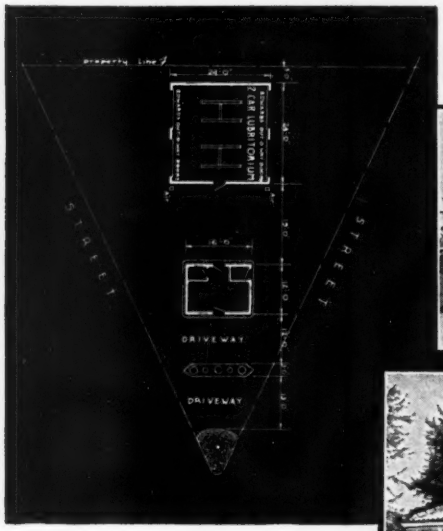
*Street*_____

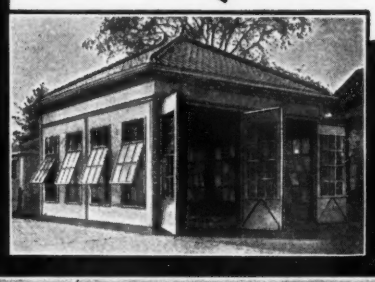
*City*_____ *State*_____

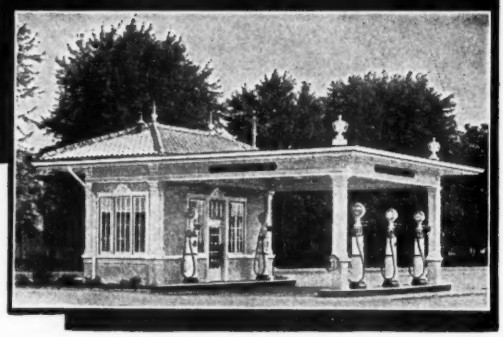


VEEDOL still fluid after 24 hours in the refrigerator . . . ready to gush to every moving part of your motor.

Your One-Stop Station as EDWARDS builds it, *Unit by Unit!*





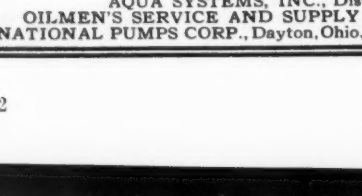


HOUSE all your departments in a One-Stop, fire-proof Edwards Service Station. Whether you need a Lubritorium, Battery or Tire Shop, Edwards can furnish them in one unit or detached, scientifically planned into your lot layout for immediate use or future expansion. For thirty years Edwards architectural and engineering staff have worked with station operators' problems. Edwards Service Stations, parking lot buildings, Lubritoriums, etc., are in use by the thousands. Their efficient step and space saving modern designs, low investment and upkeep features and outstanding attraction value have given them the preference by the leaders of the industry.

Edwards Spanish Metal Tile is the crowning glory of more than half the distinctive service stations.

It will pay you to get Edwards' proposition first. Send lot dimensions and frontage.

THE EDWARDS MANUFACTURING CO.
524-544 Eggleston Ave. Cincinnati, Ohio



"SIMPLICITY"
ONLY
3 MOVING PARTS
Means that GRANBERG METER ACCURACY is maintained over long periods.
Write for further description.

GRANBERG METER CORPORATION
"Precision Meters for Petroleum Oils"
79 New Montgomery St., San Francisco, Calif.
AQUA SYSTEMS, INC., Distributors—2 Lafayette St., New York City
OILMEN'S SERVICE AND SUPPLY CO., Distributors—142 Berkeley St., Boston, Mass.
NATIONAL PUMPS CORP., Dayton, Ohio, Manufacturers of Granberg Meter Equipped Retail Pumps

crop of cut prices in a great agricultural region.

The operations of farm co-operatives were almost forgotten because Gurney, a fiery talker, got the ears daily of thousands of car owners and farmers in the region. He told them they were being gouged. He referred to the industry as the *oil trust*. When his prices were met or prices were lowered in the territory in and around WNAX station territory he capitalized on it to increase the size of the chain.

He told his listeners that, unless they patronized WNAX stations, these stations could not exist and with their passing the price of gasoline would be 7, 10 and even 12 cents a gallon more. He is continuing such assertions. He accused the oil companies of the region, particularly the major companies because he was courting inclusion of the Independents in his chain, of unfair tactics in meeting his prices.

Two weeks after he opened his first Yankton station he appealed to the attorney general of South Dakota for an investigation of the competition of old line companies. He said they were rigging the market by sending tank wagons into the country around Yankton and to nearby towns, making a few sales at 17 cents, his price, although they were selling at higher prices in the rest of the state. The South Dakota fair trade law allows only price differentials due to varying freight rates over the state. He cited the Standard, The Texas Co., Deep Rock Oil Corp. and White Eagle Oil Corp. The state has not acted because these companies were only meeting a competitive price.

When the general price structure in the northwest was lowered in relation to the spot tank car market, Gurney took the credit for lower prices. Although an economic force was operating because of lower prices of crude oil and gasoline in the Mid-Continent he "stole the show." He said he was saving motor car, truck and tractor owners millions of dollars a year.

In a broadcast as late as Oct. 1 he claimed credit for saving gasoline consumers $62,000,000 in the preceding year in the ter-

ritory reached by WNAX. At 7 cents a gallon this huge amount would have meant 885,914,000 gallons, or about 50 per cent more gallons than are consumed in the territory. This extravagant claim is only one of the misstatements which Gurney pours into his short and peppy broadcasts each day.

He has talked frequently against a tariff on oil for which he says the Standard of Indiana is working. He has decried the three-billion-dollar merger, as he styles it, of the Standards of New Jersey and California.

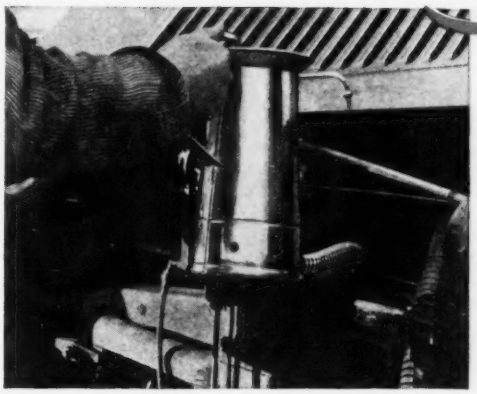
His attacks on the oil industry have been greatly like those of McMaster, also of Yankton, and close personal friend of D. B. Gurney. It was denied by Gurney that McMaster had anything to do with the WNAX stations or the idea from which they sprang. They have talked gasoline only once, Gurney told NATIONAL PETROLEUM NEWS, and that time was after the chain had been started. It was when McMaster was making an unsuccessful campaign for reelection to the United States senate. McMaster delivered one campaign speech from WNAX.

Gurney is suspected of having political ambitions but so far he has dropped no hint that he cherishes public office. Even though he might be elected to the governorship by the South Dakota farmers who have given him liberal patronage, it is certain that he would not attempt to put South Dakota into the gasoline business. That business has been too sweet for the House of Gurney to relinquish.

Some oil men believe Gurney has spent his force. They believe the introduction of the third grade of gasoline stunted the growth of the chain, but stations are still being opened under WNAX sponsorship. Growth is at a much slower rate than a year ago. One of the reasons for this may be that the general retail price structure is lower and today there are no 8 and 9-cent margins to attract new, price-cutting competition.

Gurney has a third grade at Yankton, for which he is charging 13 cents a gallon. The price of major company third grade is 14.3 cents. His intermediate grade, or regular grade, as the old line companies call their intermediate grade, is selling at

Brookins
ALL-IN-ONE MEASURE



When you buy this Brookins, you've bought a measure that will be in your service for a long, long time. You'd have to take a sledge to dent its heavy metal. The simple sturdy valve mechanism (by which you control oil flow at all times and prevent spilling) doesn't get out of order. The gleaming copper-plated finish stays new. Brookins All-in-One is

the measure
that won't "get old"

FIRST AIDS TO GOOD SERVICE

Galvanized or Tin Combination Measures with funnel and lip (non-spilling) are inexpensive.

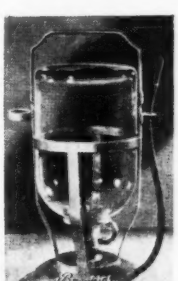
Brookoyls Special automotive oils and fluids that open the way to new services and profits.

Seamless Measures. No soldered joints. No seams to leak. Ideal for alcohol use, as well as oil.

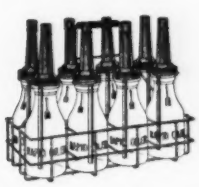
Emergency gasoline can with flexible metal hose that reaches any inlet hole without use of funnel.

Brookins Radiator Filler is staunchly made and heavily galvanized by hand dipping. A real value.

Brookins Gas Canteen. The motorist should carry one and you can make good profits on sales.



Brookins Battery Filler for quick, easy filling. Can be used for either electrolyte or water.



Brookins new improved rapid oilers. Reinforced metal spout, extra heavy glass.

Brookins Portable Drain Tank saves the cost of expensive equipment. It is easily emptied.

Practice true economy in purchasing service station equipment, by insisting on Brookins value. See your jobber salesman.

Brookins Mfg. Company, Dayton, Ohio

CARE WILL SAVE YOUR CAR
Brookins
SERVICE STATION EQUIPMENT

Confession!

"I WAS foolish enough to believe I could get along without National Petroleum News, until my boss began to ask me questions about the price of crude oil and other things that National Petroleum News covers every week.

"I flunked, and he asked me if I read the last issue of N. P. N. Well, I got h____. So I send my belated renewal to you with joy."
(Signed) J. C. R., Chicago, Ill.

J. C. R.'s honest confession carries a good suggestion to every man who depends on the "office copy" of National Petroleum News to keep him posted on the happenings in the oil industry.

You can have National Petroleum News come to you "personally addressed" 52 times a year for only $3.50. Send for your own copy today and your boss won't have a chance to give you h____.

National Petroleum News,
881 Penton Bldg., Cleveland, Ohio.

I want my own personal copy of NATIONAL PETROLEUM NEWS each week. Attached is $3.50 for 52 issues. (Foreign $5)

Name.....

Address.....

.....

15.5 cents or 0.3 cent below the price of Red Crown. He is selling an anti-knock grade at 17 cents. Ethyl gasolines are 18.8 cents in Yankton.

Last summer when the price of Mid-Continent gasoline rose following the martial shutdown of flush crude production in Oklahoma and Texas, Gurney's price was actually higher than the old line companies for a short time. Some competitors reported an increase in their gallonage at the time but according to the "grapevine telegraph" report WNAX stations sold considerably more than their average gallonage in August—the shut-down period.

Asked what he considered a fair price for gasoline, Gurney replied, "One that gives the dealer a living and is fair to the consumer."

The day after he had been asked this question he said in his radio talk:

"One of the big guns (Thanks, D. B.) was in yesterday and wondered what we called a fair price; if it was fair when so many of the companies have used the money for other things—of course, he didn't say that—they have a 70 per cent excessive investment and, whenever they do that, they want you to pay a dividend on that. A fair price should be based on a minimum investment, or rather, the minimum investment to give you service. You should not be charged up with earnings on that extra 70 per cent that is in equipment, lands, and a hundred and one other things all over the country."

He believes service station investments have been too large and told this writer there was no excuse for building a $10,000 service station in a town like Yankton. It had a population of 6072 in 1930. One of his own stations in Yankton could have been built, without equipment, for little more than $100. It was a small wooden shack with corrugated iron roof. His original station is built of stucco on concrete block. It has provisions for greasing and washing of cars. Wash jobs are $1 and greasing is 75 cents.

The accompanying table gives a comparison of margins between the cost of gasoline delivered at distributor's bulk

plant and the retail price at five points in Standard of Indiana territory and one in Standard of Nebraska territory. There are WNAX stations at all six points.

The margins are based on the average spot market price or weighted average price at Group 3 refineries and the posted service station prices of the two Standard companies. Allowance has been made for freight from Group 3, state taxes, and inspection fees.

In cases where marketers bought on the spot market low or had contracts based on the low price of the market, the margins would be 0.125 to 0.25 larger than those shown in the table.

In the year before Gurney went into the gasoline business, margins in Mankato, Minn., for example, fluctuated between 6.56 and 8.67 cents a gallon with the average above 7 cents. Since last spring margins in that territory have ranged from 6 to 6.5 cents with one drop to about 4 cents in August and early September when the Group 3 price rose after the Murray military sortie into the Oklahoma City pool.

At Fargo, N. D., margins, based on the Group 3 price of gasoline and a high freight rate, exceeded 7 cents all of last year and at one time topped 9 cents by more than 0.125 cent.

Margins in South Dakota, figures for Pierre and Huron show, have been held to a lower average level than in North Dakota. It was in South Dakota that the Standard of Indiana reduced service station price of gasoline 10.6 cents a gallon at one swoop in August, 1923, when McMaster began to retail gasoline from the state highway depot at Mitchell. After that incident the state built several bulk plants but these have all been sold to farmers' co-operatives or other private operators.

The margin at Sioux City, Iowa, about 70 miles west of Yankton, has been affected less by the one WNAX station on the westerly edge of that city than by the stations of L. L. Coryell.

More will be told about the Gurney operations in a following article.

OIL DRUMS

Birtank OIL DRUMS are manufactured in our special steel drum plant, using highest quality materials and workmanship.

We offer for prompt shipment, 50 or 55 gallon Birtank drums, black or galvanized, in standard sizes and weights in accordance with I.C.C. specifications and embossed as customer may desire. Write for prices.

Additional equipment now is being installed for the manufacture of Birtank Drums in all standard sizes . . . and will be ready for production in the near future.

OTHER BIRTANK PRODUCTS

COMPLETE BULK PLANTS
STORAGE TANKS
UNDERGROUND TANKS
LOADING CANOPIES
AIR COMPRESSORS
GASOLINE PUMPS
STEEL BUILDINGS
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GENERAL PLATE WORK
FILLING STATION BUILDINGS
GREASE RACKS
BRASS VALVES

Birtanks Are The Standard of Quality

BIRMINGHAM TANK COMPANY
Birmingham, Ala.

Sales Offices: Birmingham, Verona, Pa., New York, Tulsa, Tampa, Charlotte, New Orleans, Jackson, Miss.

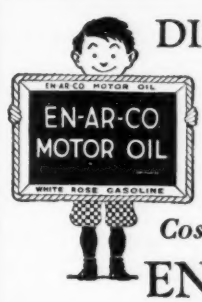
AN INGALLS BIRTANK PRODUCT

Birmingham Tank

OIL & GASOLINE DISTRIBUTION EQUIPMENT

DISTRIBUTORS—DEALERS

You Can't Beat This Pair!



WHITE ROSE GASOLINE

Costs No More Than Regular Gasoline

EN-AR-CO MOTOR OIL

Paraffine Base *Wear Proof*

Write for Contract Details

THE NATIONAL REFINING COMPANY, *Cleveland, Ohio*

PLEASANT DREAMS

that can come true . .

Those qualities you dream of finding in a Bright Stock really come true in —TP— Winter Bright Stocks.

All —TP— Winter Bright Stocks are made from 100% pure paraffine base crude with maximum pour test of Zero. —TP— blended oils will be made to your specifications on any S. A. E. viscosity numbers.

★—TP— exclusive process protected by United States letters patent No. 1803941.

TEXAS PACIFIC COAL & OIL CO.

FORT WORTH, TEXAS

WRITE, WIRE, OR TELEPHONE FOR QUOTATIONS
"A QUART . . . . A BARREL . . . . OR A TANK CAR"

Gasoline Loss Less Than One Per Cent After Vents Were Put on Tanks

By E. L. Barringer
N. P. N. STAFF WRITER

NATIONAL Refining Co. saved money on its gasoline distribution system throughout the middle west last year by installing pressure and vacuum relief vent valves on bulk plant storage tanks to reduce evaporation losses. The cost ranged from $25 to $50 a tank.

Bulk plant shortages have thereby been decreased. Total shortages from all causes at all company bulk plants for August, 1931, were .71 per cent, compared with 1.22 per cent for August, 1930.

These figures are not strictly comparative on account of various operating changes, but the company today is selling more of the gasoline shipped to bulk plants than previously when tanks were not protected against evaporation losses.

The improvement program started in 1930, but not all tanks were equipped by August. Additional storage tanks have also been erected since August, 1930, to handle the new grades of gasoline now sold by the company.

In arriving at the percentage of shortage, National Refining Co. compares its actual shortage with actual sales for the period, instead of actual shortage with inventory plus receipts. Actual loss in gallons is the same regardless of the method used to arrive at a percentage, but National Refining's method gives a larger percentage loss and helps to impress its men with the fact the loss is actually one of dollars and cents.

National Refining Co. has about 150 bulk plants in the territory between Mississippi and Minnesota, and Colorado to Ohio. Thus a variety of climatic conditions were met in checking evaporation losses.

The minimum number of storage tanks at a company bulk plant is five, 20,000-gallon tanks. The company markets three grades of gasoline, and two of kerosine. Between 6 and 7 tanks is the average for all company plants, and some distribution points have 30,000-gallon tanks.

A preliminary study of evaporation losses, preparatory to equipping all plants, was made at the Memphis bulk plant. Valves of 14 ounce pressure and ½-ounce vacuum relief were installed at this plant.

After a year shortages were compared. Previous to installation of these vent valves, the Memphis plant showed a loss of 8000 to 9000 gallons of gasoline a year. During the year the vent valves were in operation the plant showed a slight overage.

With this experience at the Memphis plant, the company began the installation of similar capacity vent valves at all distributing points. A mechanic from the valve manufacturing company was put in charge of the work. He was assisted by several boiler makers who conditioned the tanks.

As a general rule, tanks placed in service in recent years were found tight. Those four or five years old needed replacement of gaskets. Some of the older tanks required repairs on the head or seams, and a few having about 20 years of service were in such condition it was not economical to install vent valves.

Approximately 20 to 25 per cent of the tanks required work to make them vapor tight, such as new gaskets, repairs on the heads or seams.

The tanks are covered with aluminum paint. The local manager is responsible for their condition. When recoating is necessary he requisitions the company's painting crew for the work. Tanks are given one coat of paint, and spots needing more attention are gone over a second time.

Storage tanks are filled from the bottom. The fill pipe enters the tank at the top, but extends nearly to the bottom. This method keeps agitation of the gasoline at a minimum, and is an aid in reducing evaporation losses.

Prior to the installation of the vent valves the company gauged contents of tanks daily. This operation was changed to taking inventory once a week.

Each time inventory is taken the gauge hatch is opened, and the built-up pressure dissipated into the air. By reducing the number of inventories one-sixth the company keeps down the loss through evaporation.

THE average cost for equipping the older tanks was about $50. This price includes the cost of the vent valve, repairs to make the tank vapor tight, and the labor. Newer tanks, not requiring conditioning, were equipped with vent valves by the company's mechanics. This cost was about $25 a tank.

Shortages are recorded by bulk installations complete and not by individual tanks, and include losses from all sources, so there is no data on the definite time required to repay the investment in reducing evaporation losses.

Company officials estimate that savings at bulk plants in southern states repaid the investment quicker than those in northern bulk plants on account of the difference in climatic conditions and their effect on evaporation.

Closer Scrutiny of Credits Needed By Marketing Companies

CREDIT by oil marketing companies must be extended cautiously and only after assurance that bills will be paid promptly and that the size of the account will make it profitable to carry on the books, R. G. Amo, credit manager of the Producers & Refiners Corp., of Tennessee, told the recent fall conference at Excelsior Springs, Mo., of the Petroleum Refiners Division, National Association of Credit Men.

We are living in a liquidating age, he said, and the time is here when those in the petroleum business must put their house in order and merchandise their wares along sound economic lines. He said in part:

"On every hand you will see evidence of jobbers becoming more credit conscious, but many suffered tremendous losses before they appreciated the importance of this branch of their business. The movement to stop loaning equipment is a wise one. We have put too many people in the gasoline business who had nothing; and when they exhausted the credit capital we loaned them, we suffered a net loss from the transaction.

"Present net margins on gasoline, sometimes as low as one cent per gallon, will not permit adding the credit risk. When it is realized that a $100 credit loss is equal to one cent per gallon on 10,000 gallons of gasoline, it behooves us to carefully consider whether we are failing to appreciate the *cost* of loaning our goods as against the superior features of a cash transaction with its increased turnover. In all states having gasoline tax we shoulder an added credit burden.

"Good credit business is desirable business, and the object of all credit departments is to build up profitable business for their company. In order for a credit business to be good and profitable it is necessary that it be made up of such accounts as will be paid promptly when due.

"The margin of profit and time required for the reseller to turn the merchandise into cash determines the proper term. Gasoline is quickly consumed, carries a small margin, therefore the term is short. Retail sales on credit can be handled profitably on a monthly basis where by the buyer is entitled to the courtesy of a charge account.

"When the file on each new account is analyzed, the credit department must determine whether or not it will be a profitable connection.

"Constant vigilance is required to protect working capital as long as the credit hazard exists, and that hazard is present until every account is liquidated.

"Oil people in the middle west feel the damage done to farmers whose business was solicited by some companies who delivered petroleum products last spring to be paid for at harvest time. When harvest came, many farmers were bankrupt, as the future income they mortgaged did not materialize due to drop in price of wheat and other products.

"We are courting trouble when we approve long term dating on merchandise that has a cash margin. A large number of farmers have not paid for the gasoline and oil they purchased last year."

Burner Service is Important Part In This Heating Oil Business

OMAHA, Nebr.

THE U. S. Oil Works of Omaha sells and services domestic oil burners as part of its furnace oil business. The company sells the Bennett-Allison burner which is made in Omaha, but services all makes.

Three men with small trucks do the servicing and inspection work. These men also are the furnace oil salesmen because they have periodic contacts with the 725 furnace oil customers whose needs they know.

These three men install new burners in summer and fall. In the winter they inspect each furnace oil customer's burner at least once a month and adjust it. They are subject to night, Sunday and holiday call in case something happens to a burner. The service is free to oil customers.

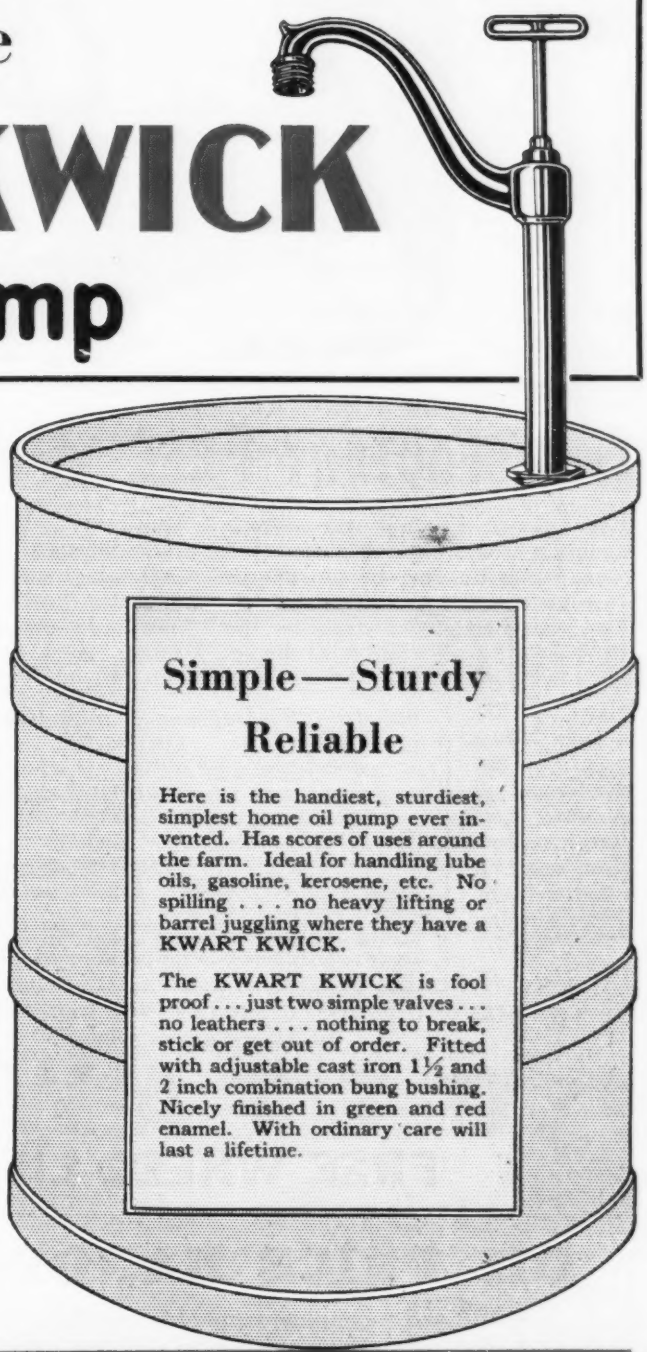
The company begins to fill customers' tanks in August and September. Bills for the oil are malled Oct. 1.

The company handles the No. 2 and No. 3 grades of furnace oils. These are the next two grades heavier than kerosine distillate. The No. 2 grade sold this fall at 6½ cents a gallon and No. 3 at 6 cents. This was in spite of cut price competition which advertised No. 1 grade, the lightest furnace distillate, for 4.9 cents and the No. 2 for 4½ cents. No service was offered by the cut price seller.

A card index of customer requirements is kept in the company's office. Each customer's card gives the make of burner, size of tank, grade of oil required, and pointers about deliveries. Many customers have some particular prejudice which must be avoided. These prejudices are noted and drivers of delivery trucks are instructed in them before leaving the bulk plant and warned that the customer's hobby must be respected. This has done much to build goodwill for the company's heating oil business. Drivers report any new quirks to the office and they are recorded on the cards.

The company operates four trucks on burning oil deliveries. One carries a 1600-gallon tank and two have 1200-gallon tanks. A 900-gallon tank truck is used for special deliveries. All trucks have power pumps and carry 150 feet of 1-inch hose on

Turn Quart Buyers into Bulk Customers
Increase Your Bulk Oil Sales and Profits
with the inexpensive
KWART·KWICK
Home Oil Pump



Investigate this amazing builder of Bulk Oil Sales and PROFITS

To win new customers . . to hold old ones . . to sell drums instead of quarts to the home garage owner . . to make a new and stronger sales appeal to your farm trade . . investigate the KWART-KWICK Home Oil Pump. Has been successfully merchandised by scores of oil companies . . from the largest to the smallest. A proven builder of bulk oil sales and PROFITS.

The KWART KWICK may be merchandised in several different ways. Some sell it at cost to bulk buyers. Others loan it to bulk purchasers . . to remain with the purchaser so long as he purchases exclusively from the loaning company. Still others sell it on a contract which gives the pump to the user after he has purchased so much oil or gas.

The KWART-KWICK is so low in price . . so universal in its appeal . . that you should at least investigate the profit-possibilities of this efficient, low-priced home oil pump. What it has done for other oil companies it can do for yours. For complete information and special quantity prices . . fill out and mail coupon below TODAY.

Simple—Sturdy Reliable

Here is the handiest, sturdiest, simplest home oil pump ever invented. Has scores of uses around the farm. Ideal for handling lube oils, gasoline, kerosene, etc. No spilling . . . no heavy lifting or barrel juggling where they have a KWART KWICK.

The KWART KWICK is fool proof . . . just two simple valves . . . no leathers . . . nothing to break, stick or get out of order. Fitted with adjustable cast iron 1½ and 2 inch combination bung bushing. Nicely finished in green and red enamel. With ordinary care will last a lifetime.

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Distributors and Jobbers in all Principal Cities in the United States and Foreign Countries.

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Please send complete information and special quantity prices on the KWART KWICK Pump. There is no obligation.

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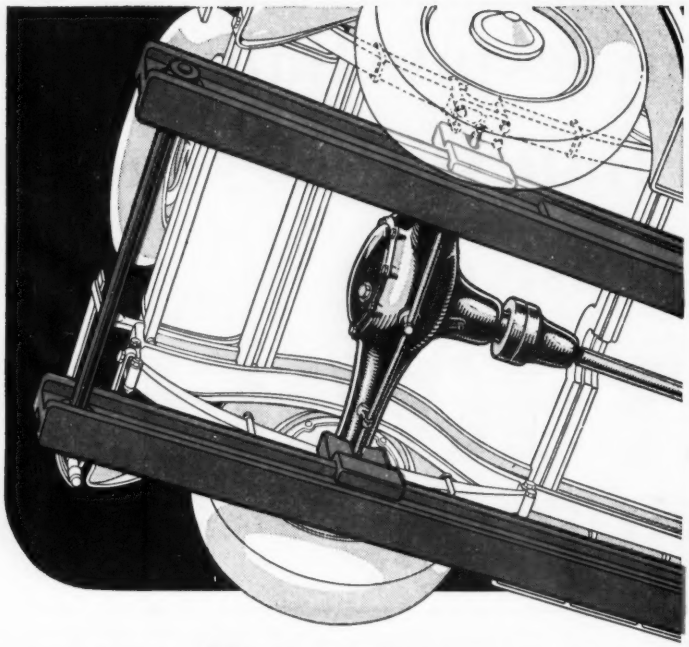
8 Models including Free Wheel and Drive-On Lifts



A SATISFACTORY FREE WHEEL LIFT

The Ottawa Free Wheel Superstructure is the 4-point suspension type, lifting the rear of the car as well as the front by its axles. There is no weight or strain on the differential housing and it is fully accessible. Axle chocks of special design permit the easy handling of any car without interference with truss rods or underhanging shock absorbers or snubbers. Wide spaced lifting rails, strongly reinforced, only four inches high, provide maximum clearance for low slung cars. Ample working room and easily accessible under-parts increase speed and profits. Write for details and prices on Lifts, also Ottawa Visible and Electric Gasoline Pumps, Air Compressors, Air Stands and Grease Guns.

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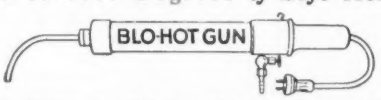

The Ottawa BLO-HOT Heat Gun

furnishes from 600 to 1,000 degrees of safe heat, without a flame. Drains transmissions and differentials quickly in the coldest weather. It thaws out radiators, carburetors and fuel lines. It dries out spark plugs, brake bands, etc. No moving parts. Costs less than five cents per hour to operate. Now only $16.50 f.o.b. OTTAWA. Write for full particulars.

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a reel. This length permits the reaching of any tank without the necessity of the truck leaving the street.

The service trucks carry 60 gallons of oil each on the inspection trips throughout the winter because some of the emergency service calls are the result of dry tanks and not mechanical maladjustments. Some oil burner owners are like some automobile owners in that they let the fuel supply get too low.

At the end of each heating season the company cleans the truck tanks and puts the trucks into gasoline service.

NEW EQUIPMENT

Wood Hydraulic Hoist & Body Co., Detroit, has appointed T. D. Kingsley, formerly vice president of S. F. Bowser & Co., Inc., general sales manager of its Gar Wood boiler division.

* * *

Wilson & Bennett Mfg. Co., Chicago, has oppointed Southwest Sales Co. Inc., Dallas, Texas, sales representative for Texas.

J. B. Shortridge and W. M. Roberts will cover this territory, and will have a large warehouse stock of popular sizes and styles of steel shipping packages for prompt delivery.

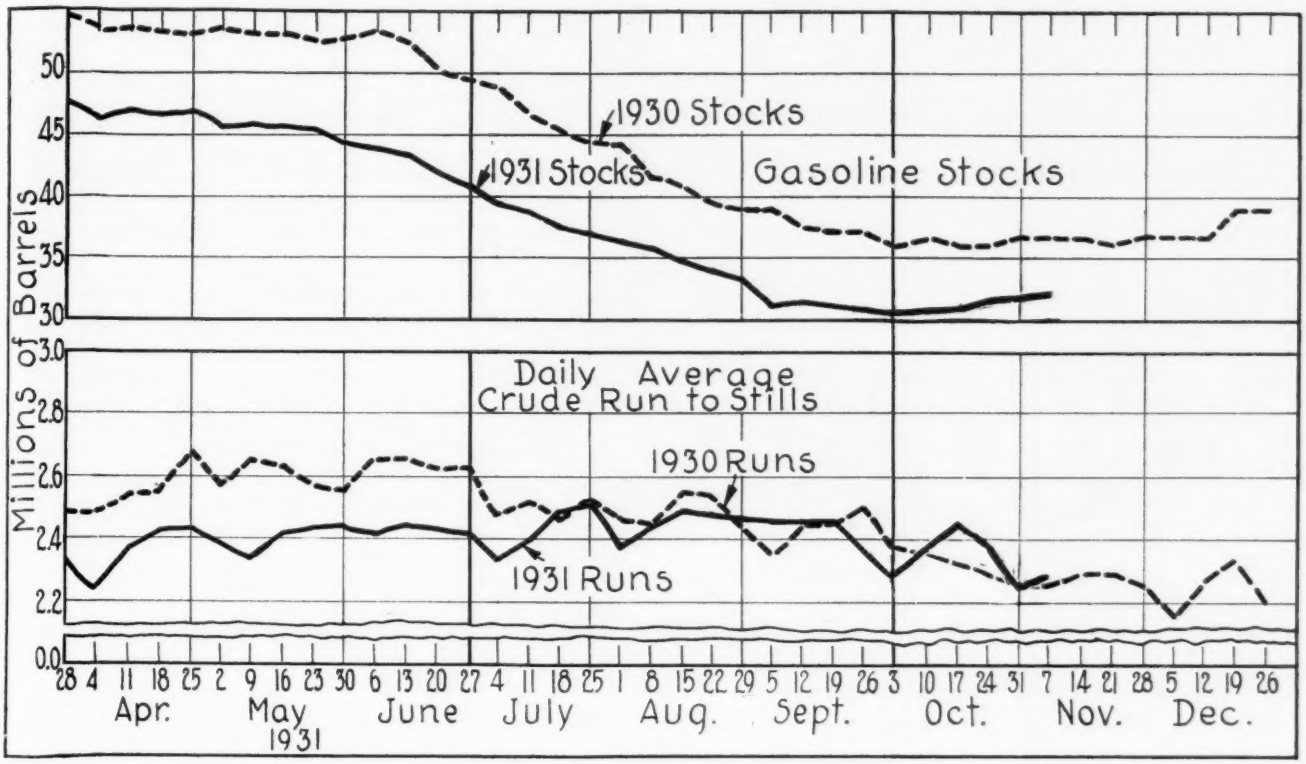
* * *

The Foxboro Co., Foxboro, Mass., has developed a new recording thermometer which gives "true bulb temperatures," irrespective of summer heat or winter cold, the company claims. It is known as the "Anti-Ambi" recording thermometer and is not affected by ambient temperatures (case and tubing temperatures).

The case and tubing may be enclosed in a cabinet and the temperature changed rapidly or slowly up and down for 50° and the pen will remain perfectly steady. The thermometer is designed for use on temperature ranges up to and including 250° F.

A special construction feature is the small bulb. The thermometer is so designed that it can make use of a sensitive bulb as small as one inch long. This feature is useful particularly in measuring temperature in pipes.

U. S. Crude Runs and Gasoline Stocks as Reported Weekly by A. P. I.



Small Upturn Again Shown in Gasoline Stocks

By Telegraph

NEW YORK, Nov. 10

GASOLINE stocks at refineries stood at 32,071,000 barrels Nov. 7, according to the American Petroleum Institute. This appears to be a gain of 626,000 barrels over Oct. 31 stocks but actually the gain is only 46,000 barrels as 580,000 barrels of motor fuel was discovered in California. This volume had not been reported previously.

Stocks of gasoline increased 96,000 barrels east of California. Stocks in California, outside the discovery, were lowered 50,000 barrels. East of California stocks were increased at East Coast, Texas and Louisiana-Arkansas plants. Elsewhere stocks were lowered.

Bulk terminals east of California held 11,551,000 barrels of gasoline Nov. 7, compared with 11,483,000 barrels Oct. 31. Gasoline in transit was 1,415,000 barrels Nov. 7 and 2,044,000 barrels Oct. 31.

Crude oil runs to stills averaged 2,294,000 barrels a day at plants having 95.2 per cent of the operating capacity of the country. The week before runs averaged 2,335,400 barrels at these plants. Rate of operation was 62.6 per cent of capacity last week and 63.7 per cent the week before.

Reported fuel oil stocks show an increase of 1,243,000 barrels but this volume contains 680,000 barrels found in California which had not been reported previously.

Current Refinery Operations

Districts	Per Cent Capacity Reporting	Daily Average Crude to Stills (Barrels) Week Ended		Per Cent of Reporting Capacity Operated Week Ended		Stocks (Thousands of Barrels) Gasoline		Gas & Fuel Oil		% of Total Capacity Reporting	Cracked Gasoline Production Daily Av. Production (Barrels) Week Ended	
		Nov. 7	Oct. 31	Nov. 7	Oct. 31	Nov. 7	Oct. 31	Nov. 7	Oct. 31	Nov. 7	Nov. 7	Oct. 31
East Coast	100.0	467,300	476,700	73.7	75.2	4,116	3,931	10,378	10,223	94.0	92,700	92,100
Appalachian	91.8	85,400	100,300	62.2	73.0	1,319	1,343	1,668	1,654	96.1	24,300	25,900
Ind., Ill., Ky.	98.9	302,100	319,300	70.0	74.0	3,183	3,208	5,647	5,519	95.5	85,300	88,300
Okla., Kans., Mo.	89.6	234,300	249,600	53.8	57.4	2,633	2,843	4,896	5,095	92.3	52,700	59,600
Texas	91.3	549,000	563,300	71.7	73.6	5,810	5,676	12,026	11,688	96.8	143,300	140,800
La., Ark.	98.9	160,300	140,100	69.5	60.8	830	779	3,904	3,807	100.0	38,300	40,300
Rocky Mountain	89.4	32,400	33,700	22.5	23.4	1,236	1,251	814	826	98.5	15,000	13,400
California	97.1	463,200	452,400	52.2	50.9	*12,944	12,414	**97,717	96,895	100.0	40,600	42,000
Total	95.2	2,335,400	2,235,400	62.6	63.7	32,071	31,445	137,050	135,707	95.6	492,200	502,400
Texas (Gulf Coast)	99.8	431,000	441,000	81.1	83.0	4,639	4,380	8,738	8,362	98.6	114,100	112,300
La. (Gulf Coast)	100.0	112,400	92,400	76.2	62.6	719	665	3,059	2,938	100.0	28,100	30,900

*Includes 580,000 bbls. storage in tank farms not previously reported.
**Includes 680,000 bbls. storage in tank farms not previously reported.

Compilation Of Mid-Continent Refinery Operations

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Mid-Continent Refinery Operations, Week Ended November 6 (By Telegraph)

	Kansas	Oklahoma	North & Cent. Texas	West Texas	North La.-Ark.	Total Week Ended Nov. 6
Plants Reporting	10	23	23	10	10	76
Da. Av. Cap. (bbls.)	94,000	162,500	107,400	71,500	60,700	496,100
Da. Cracking Capacity	53,200	64,600	23,100	26,250	31,700	198,850
Da. Av. Crude Runs	57,312 + 7.2	84,154 — 3.1	60,973 — 5.7	15,540 — 0.9	42,452 + 12.8	260,431 + 0.8
Da. Av. Other Oil	7,130 — 6.2	2,218 + 67.0	2,169 — 56.0	....	16,454 + 8.5	27,971 — 3.7
GASOLINE—Gallons						
Stocks, Oct. 30	22,885,000	34,412,000	29,767,000	13,291,000	3,993,000	104,348,000
Prod. 10-30 to 11-6	11,207,000 — 4.2	13,018,000 — 10.9	9,400,000 — 3.2	1,480,000 — 3.8	6,754,000 + 15.0	41,859,000 — 3.7
Ship. 10-30 to 11-6	11,622,000 — 00.1	15,343,000 — 5.4	9,147,000 + 24.5	1,893,000 — 50.7	6,903,000 + 1.3	44,908,000 — 2.0
Stocks, Nov. 6	22,470,000 — 1.8	32,087,000 — 6.8	30,020,000 + 0.8	12,878,000 — 3.1	3,844,000 — 3.7	101,299,000 — 2.9
Ratio Sales to Prod.	103.7%	117.9%	97.3%	127.9%	102.2%	107.3%
KEROSINE—Gallons						
Stocks, Oct. 30	11,826,000	14,178,000	2,562,000	4,000	384,000	28,954,000
Prod. 10-30 to 11-6	1,451,000 — 20.5	1,579,000 — 16.0	1,029,000 + 12.8	43,000	331,000 + 5.4	4,433,000 — 10.1
Ship. 10-30 to 11-6	1,193,000 — 6.7	1,764,000 + 7.0	1,304,000 + 4.3	11,000 + 10.0	317,000 + 21.9	4,589,000 — 4.3
Stocks, Nov. 6	12,084,000 + 2.2	13,993,000 — 1.3	2,287,000 — 10.7	36,000 +800.0	398,000 + 3.6	28,798,000 — 0.5
Ratio Sales to Prod.	82.2%	111.7%	126.7%	25.6%	95.8%	103.5%
STOVE DISTILLATE—Gallons						
Stocks, Oct. 30	2,395,000	13,055,000	347,000	86,000	37,000	15,920,000
Prod. 10-30 to 11-6	250,000 — 38.3	29,000 — 95.1	241,000 + 19.9	38,000 + 52.0	46,000 + 17.9	604,000 — 52.1
Ship. 10-30 to 11-6	377,000 — 21.8	688,000 + 98.3	179,000 — 3.8	53,000 +112.0	44,000 + 33.3	1,341,000 + 25.0
Stocks, Nov. 6	2,268,000 — 5.3	12,396,000 — 5.0	409,000 + 17.9	71,000 — 17.4	39,000 + 5.4	15,183,000 — 4.6
Ratio Sales to Prod.	150.8%	2,372.4%	74.3%	139.5%	95.7%	222.0%
GAS OIL—Gallons						
Stocks, Oct. 30	11,866,000	40,663,000	7,838,000	1,539,000	7,760,000	69,666,000
Prod. 10-30 to 11-6	835,000 + 73.2	1,596,000	991,000 — 34.5	528,000 + 16.8	2,481,000 + 17.0	6,431,000 + 82.0
Ship. 10-30 to 11-6	618,000 — 20.5	2,729,000 + 72.2	954,000 — 8.4	382,000 — 24.4	3,037,000 + 26.4	7,720,000 + 35.3
Stocks, Nov. 6	12,083,000 + 1.8	39,530,000 — 2.8	7,875,000 + 0.5	1,685,000 + 9.5	7,204,000 — 7.2	68,377,000 — 1.9
Ratio Sales to Prod.	74.0%	171.0%	96.3%	72.3%	122.4%	120.0%
FUEL OIL—Gallons						
Stocks, Oct. 30	14,857,000	70,640,000	88,582,000	21,621,000	19,840,000	215,540,000
Prod. 10-30 to 11-6	5,016,000 — 0.9	5,211,000 + 1.9	5,482,000 — 0.9	1,128,000 — 6.3	4,625,000 + 11.8	21,462,000 + 2.0
Ship. 10-30 to 11-6	3,665,000 — 22.8	4,904,000 — 17.8	5,830,000 — 0.3	648,000 — 79.8	4,716,000 — 19.3	19,763,000 +22.9
Stocks, Nov. 6	16,208,000 + 9.1	70,947,000 + 0.4	88,234,000 — 0.4	22,101,000 + 2.2	19,749,000 — 0.5	217,239,000 + 0.8
Ratio Sales to Prod.	73.1%	94.1%	106.3%	57.4%	102.0%	92.1%

Gasoline Produced by Various Methods, Week Ended November 6

	Kansas	% of Total	Oklahoma	% of Total	North & Cent. Texas	% of Total	West Texas	% of Total	Louisiana-Arkansas	% of Total	Total	% of Total
Straight Run	5,712,000	51.0	8,247,000	63.4	5,482,000	58.3	1,384,000	93.5	3,205,000	47.5	24,030,000	57.4
Cracked	4,557,000	40.7	3,732,000	28.6	2,924,000	31.1	....		2,901,000	43.0	14,114,000	33.7
Natural	938,000	8.3	1,039,000	8.0	994,000	10.6	96,000	6.5	648,000	9.5	3,715,000	8.9
Total	11,207,000		13,018,000		9,400,000		1,480,000		6,754,000		41,859,000	

+ or — columns are % change over previous week.

Mid-Continent Gasoline Stocks Cut 3,000,000 Gallons

Staff Special—By Telegraph

TULSA, Nov. 10

MID-CONTINENT refiners increased their crude charges to stills 2000 barrels daily average in the week ended Nov. 6. Increases were reported by Kansas and Louisiana-Arkansas refiners. In other districts runs were less than in the preceding week.

Gasoline output was cut 1,500,000 gallons in the whole district. Output was larger than in the preceding week in only the Louisiana-Arkansas district.

Gasoline shipments were down 900,000 gallons. Stocks were lowered 3,000,000 gallons. All districts except Texas cut inventories.

Kerosine stocks were reduced 200,000 gallons. Distillate stocks were lowered 700,000 gallons when production was curtailed and shipments increased.

Gas oil stocks were reduced 1,200,000 gallons. Fuel oil stocks increased 1,600,000 gallons.

Summary for the Month

Production and shipments, all reporting refineries, for four weeks ended Nov. 6. Change in stocks figured from Oct. 9.

GASOLINE

	Gallons
Production	179,055,000
Shipments	183,551,000
Net change in stocks	—4,496,000
Ratio sales to production	102.5%

KEROSINE

	Gallons
Production	19,125,000
Shipments	18,715,000
Net change in stocks	+410,000
Ratio sales to production	97.9%

STOVE DISTILLATE

	Gallons
Production	5,234,000
Shipments	7,648,000
Net change in stocks	—2,414,000
Ratio sales to production	146.1%

GAS OIL

	Gallons
Production	19,270,000
Shipments	23,905,000
Net change in stocks	—4,635,000
Ratio sales to production	124.1%

FUEL OIL

	Gallons
Production	91,326,000
Shipments	96,166,000
Net change in stocks	—4,840,000
Ratio sales to production	105.3%

Outlook is Bright Jobbers Told

STATESVILLE, N. C., Nov. 4.—Independent marketers have a brighter outlook as merchandising tends towards more aggressive selling through the advantages inherent in local merchants, so oil men attending the convention of the North Carolina Independent Oil Jobbers Association here today were told.

With a diminishing number of customers for each station, the merchandising trend of the future was predicted as one of intensive, intelligent selling to make stations profitable. The address was given by E. L. Barringer, NATIONAL PETROLEUM NEWS staff writer.

The local oil man was shown as having an inherent opportunity in merchandising through his intimate knowledge of what customers need and how they can be sold. These opportunities were overshadowed in past years by merchandising through expansion of the number of outlets.

Examples were cited of various major oil companies placing their retail outlets on a commission basis, or renting out stations to obtain advantages of merchandising with local oil men.

E. R. Burt, Biscoe Oil Co., Biscoe, president of the association, and L. H. Martin, L. H. Martin Inc., Greensboro, secretary, presided at the convention.

Following the luncheon, and address, members gathered for an informal discussion of their merchandising problems.

Members voted to hold another convention in January at the time the state code of ethics committee meets.

Road Oil Association Planned at Tulsa

TULSA Nov. 7.—Further steps toward the formation of a Mid-Continent Road Oil Association were taken at a meeting of refinery representatives with the petroleum research bureau of the Tulsa Chamber of Commerce Nov. 5.

A tentative constitution was proposed and adopted. A committee of six identified in some capacity with the oil refining interests and with Emby Kaye of the Skelly Oil Co. as chairman was appointed to formulate a definite plan whereby such an association could function.

The report of this committee will be referred to a refiners' committee which will attempt to obtain sufficient membership to give the association substantial support.

Present plans call for the development of standards for road oil and a publicity campaign to acquaint the public with the benefits of a scientifically constructed oiled highway.

PARTICULARLY true of Freedom *Low Cold Test Oils* are such endorsements as "If there is a refinery that produces better oil than Freedom, we have been unable to find it" and "When it comes to quality, Freedom is right on top." These opinions express the satisfaction of the 700 and more jobbers who market Freedom 100% Pennsylvania Motor Oils under their own brand name or one of our brands and make the handsome margin of profit that goes with it.

Freedom *Low Cold Test Oils* fully meet the severe demands of winter driving. Made of the finest 100% Pennsylvania Crudes, refined and dewaxed by special Freedom processes which include pressing at temperatures below zero, they possess all of the extra lubricating characteristics for which Freedom has become famous and in addition provide appreciable easier starting in coldest weather.

We would like to supply you with Freedom *Low Cold Test Oils*, also other motor oils made (Sharples Process) to your specifications or tested specifications of this 52-year-old organization. Quick shipments in tank cars, compartment tank cars or carloads of barrels or drums. Your request for full information and quotations will receive immediate attention.

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Refinery - Tank Wagon Markets

Markets Featured by Rising Prices; Optimism Spreads to All Areas

CLEVELAND, Nov. 9

OIL markets were featured by a flood of rising prices the first week in November.

Crude oil prices, tank car gasoline prices and retail gasoline prices, all came in for notable play. While the higher prices were confined pretty much to the Middle West, the Mid-Continent in particular, it was apparent late in the week that the general improvement there was spreading rapidly to other parts of the country.

Following the 15-cent increase in Mid-Continent crude oil prices made by Continental Oil Co., practically all other leading crude buyers raised their prices. Purchasers of eastern crudes more or less comparable with Mid-Continent crude also raised their prices.

Tank car prices for gasoline in all Mid-Continent markets and also in the Chicago market immediately experienced further substantial gains. The climax to an exciting week for the middle western trade came on Thursday when Standard Oil Co. of Indiana announced that tank wagon and service station prices of all grades of gasoline would be advanced 1 cent a gallon throughout its marketing territory on the following day.

There followed a series of advances in retail gasoline prices by other Standard companies, mainly the Ohio, Louisiana, Nebraska, and Continental companies.

Jobbers in the middle west sat back somewhat astonished by the whirl of rising prices. There were some indications of increased open market buying of gasoline but generaly speaking activity still was confined largely to contracts. The open market, however, was kept fairly free of offerings and there was, therefore, no deterring factor to hold tank car prices back.

Prices had risen in the Mid-Continent to the extent that some middle western buyers found it to their advantage to seek their requirements in Pennsylvania. There was heavy trading of gasoline in Pennsylvania throughout the week with buyers who normally look to this market for their requirements becoming active at the tail end of the week.

Practically all the distress gasoline available in Pennsylvania was eliminated and the market for U. S. Motor stood at a minimum of 4.375 cents Nov. 7 after a dip to under 4 cents earlier in the week.

Jobbing demand was more active in the eastern seaboard markets. Several large refiners announced increases of 0.25 to 0.5 cent in tank car gasoline prices on Nov. 7 to become effective Nov. 9.

Trading of heavy oils in the tank car markets was relatively quiet. Prices showed very little change in any territory except Pennsylvania. As a result of the recent reduction in crude oil prices there, lubricating oils were quoted 1 to 1.5 cents a gallon lower.

Cargo markets were quiet. Prices at the Gulf advanced in sympathy with the higher Mid-Continent prices. California prices were generally unchanged.

Chicago Prices Higher After T.W. Advance

Staff Special

CHICAGO, Nov. 7

THE 1-cent advance in retail gasoline prices by the Standard of Indiana was the high-light of the Chicago market in the week ended Nov. 7. This advance came Nov. 6 following advances in crude oil prices by major purchasers and after several weeks of steadily advancing tank car prices.

Open market gasoline buying was rather spotty during the week. Traders generally reported a very good demand Nov. 2 and 3, followed by a light movement the next two days and then a pick-up following the tank wagon advance.

Buying by jobbers under contract was reported good nearly all week, falling off somewhat the last two days. Most of the contract buying was done at prices considerably under the prevailing open market price, due to guarantee margins, but the 1 cent advance in the retail market also moved these contract prices higher, which was expected to swing some of these buyers to the open market. Several refiners reported that most of their contract jobbers had anticipated the advance and had nearly filled their storage, which would keep them out of the market for some time.

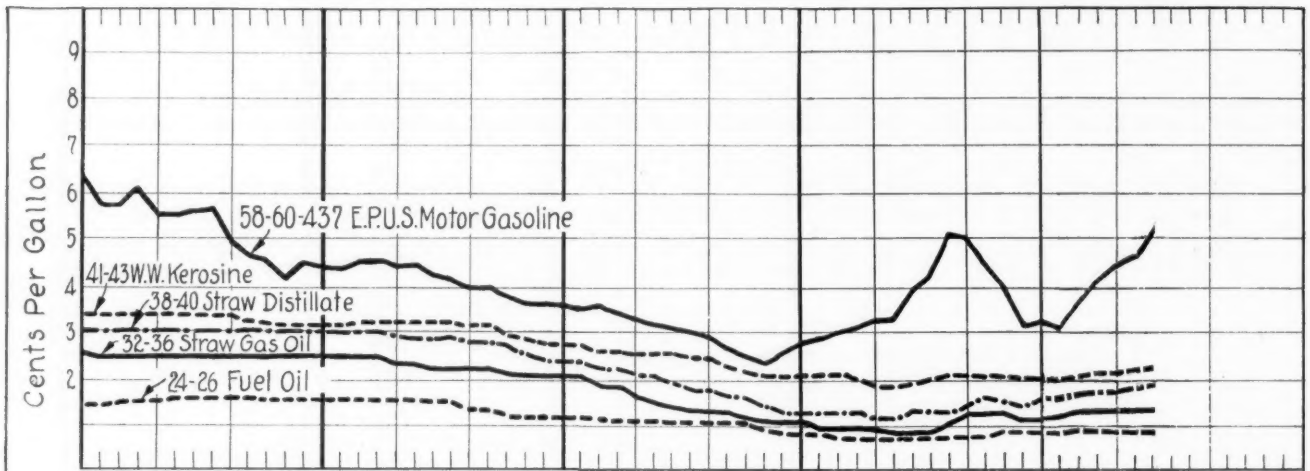
Summary of Group 3 Quotations for U. S. Motor Gasoline
In Effect Nov. 9, 1931

	Below 57 Octane No.	57-65 Octane No.	Above 65 Octane No.
Okla.	4.75-5.00	5.00-5.25	5.25-5.50
Kans.	4.75-4.875	5.00-5.125	5.25-5.375
N. Tex.	4.625-4.75	4.875-5.00	5.125-5.25
W. Tex.	4.625-4.75	4.875-5.00	5.125-5.25
La.-Ark.	4.75	5.00	5.25
Ind.-Ill.	4.50-4.75	.....	.....

Prices are those quoted on the basis of f.o.b. Group 3 by refiners in the districts designated.

Spot gasoline prices advanced 0.25 to 0.5 cent, depending on the grade, during the week. Up to Nov. 6, traders generally asked 4.25 to 4.5 cents for U. S. Motor, below 57 octane number, coming from Mid-Continent or Indiana-Illinois refineries and were holding steadily at 4.5 to 4.75 cents as the week ended. Sales of U. S. Motor, mostly with a low octane rating, for shipment to points in Ohio, Indiana and Michigan were reported at 0.375 to 0.5 cent under the prevailing general spot market. Most of this gas-

Current Prices of Principal Mid-Continent Refined Products



Prices shown are in Group 3 basis and extended to date shown in Refinery Market Table Section of this issue

oline was reported coming from Pennsylvania refineries, although some was reported moved from Kentucky and Ohio. Several carlot marketers, who moved some of this differential territory gasoline early in the week, said they had no more available during the last few days.

The higher gravity gasolines remained in steady demand and the 68-70, 350-360 e.p. and 64-66, 375 e.p. grades were quite scarce for prompt shipment. Prices of these grades generally moved up 0.375 cent during the week.

Kerosines also participated in the general price advances, although no change was made in retail kerosine prices. Sales of 41-43 w.w. were reported at 2 to 2.125 cents during the week, but by Nov. 7 practically none was reported available at 2.125 cents and many sellers advanced their price to 2.25 cents. It was reported that a considerable quantity of kerosine was purchased Nov. 5 and 6 for export shipment. Domestic demand was fairly active.

Good grades of distillate, gas and fuel oils, suitable for use in domestic burners, remained steady. Demand was fair and no amount of distress oil was reported available at under publication prices.

Pipeline-Oil Company Divorce Bills To be Considered by Congress

WASHINGTON Nov. 9

OIL company pipelines will probly be made a figure of major size in Washington this winter. At least one bill divorcing them from their oil industry proprietors will be introduced in Congress. Representative Hoch of Kansas has announced his intention to introduce a divorcing bill. His thought is that pipelines in the hands of big producers refiners and marketers are inimical to "independent producers."

In the last Congress he introduced a bill making the commodities clause of the interstate commerce law applicable to them as recommended by the Association of Railway Executives in the program they adopted in November, 1930, and which they did not reiterate at their latest meeting a few weeks ago although they then approved everything else they suggested in 1930.

Hoch says he will press his measure this year. The Hoch and other pipeline divorce bills of the last session of Congress were founded upon a false assumption. This was that the commodities clause, if imposed upon the pipelines, would have the effect of divorcing pipelines from other branches of the petroleum industry.

Hoch is of the opinion that a tariff is not enough for the independent producers. In a discussion of the general subject he called attention to the fact that pipelines often declared dividends of 40 per cent or more, on small capitalizations, without regard to the value of the properties. He wanted to know what chance an independent producer had against a combination of pipeline, production, refining and marketing facilities.

A colloquy between Interstate Commerce Commissioner Aitchison and James Lawrence, a few days ago in which Lawrence appeared for Mid-Continent refiners in a case involving freight rates on petroleum and its products from Casper, Wyo., to the Dakotas disclosed that the question of further pipeline regulation, with the possibility of having the rate regulating body impose minimum rates to be charged by pipeline companies, was under consideration. Lawrence expressed the opinion that the cost of transportation by pipeline was not any lower than transportation by railroad.

"In my opinion," said Lawrence, "this commission is confronted with the very difficult task of absolutely regulating the rates between pipelines and the railroads and fixing rates by

Prices A Year Ago

Nov. 10, 1930

	Oklahoma	Penna.
58-60 U. S. Motor Gasoline	4.875-5.375	6.50-6.75
Grade A Natural Gasoline	4.50-4.75	.....
Kerosine (Okla. 41-43; Pa. 47 w. w.)	3.125-3.50	5.25-5.75
Fuel Oil (Okla. 24-26; Pa. 36-40)	$0.65-$0.70	3.625-3.875
Crude (Okla. 35-35.9)	$0.92	$2.00
Chicago tank wagon (including 3c tax)		16.00c

pipelines. I think that commercial conditions demand it and I believe the day is here when that is an important factor and I believe that the law should say that this Commission should say when and where pipelines should be built."

"It may be," said Aitchison, "that we will have to get that power if we do not have it now, to prescribe minimum rates by pipelines."

Aitchison said that he was merely thinking out loud when he said that. He suggested that if the pipelines made too much money Congress might provide for recapture of some of it. Lawrence said that if the real costs of transportation by pipelines were ascertained there would not be much to recapture, and expressed the belief that the pipeline rates should be related to rail rates, as were rates by water, pipeline rates being made about 80 per cent of the rail rates.

Cut Rail Rates to Meet Tank Truck Costs

WASHINGTON, Nov. 9.—With a view to forestalling tank-truck competition, the Pennsylvania and the New York Central, in about a week, will make a rate of 13 cents a hundred pounds on gasoline, kerosine and furnace oil, from Neville Island, Pa., to Youngstown, O. It is to replace a rate of 15 cents. The Interstate Commerce Commision has authorized them to publish the rate on ten days notice.

In their application the two big systems said that a refiner at Neville Island (Cities Service?), not named by them, had acquired the Rajah Oil Co. at Youngstown and desired to ship by railroad if it could obtain a rate competitive with tank truck transportation. The railroads figured tank truck transportation at 20 cents a mile loaded and empty, and offered the 13-cent rate as one that would keep the traffic.

Hoch-Smith Rail Rates Postponed Again

WASHINGTON Nov. 9.—The Interstate Commerce Commission has postponed the effective data from Dec. 3 to Feb. 15 on rates on petroleum and its products under the Hoch-Smith resolution which originally was to become effective early this year.

The change was made by the commission on solicitation of the railroad tariff publishing agents. These agents reported that other work prevented preparation of the tariffs on Dec. 3, and asked that the rates be made effective Feb. 1 on 15 days' notice. The commission set the effective data for Feb. 15 on 30 days notice.

Mid-Continent Refinery Markets

Gasoline Markets Advance 0.25 To 0.50 Cent

Staff Special
TULSA, Nov. 7

GASOLINE markets in the Mid-Continent advanced 0.25 to 0.5 cent a gallon in the week of Nov. 2 to 7 as a result of the series of crude oil and retail gasoline price advances. Other oils were not affected immediately by the crude advances.

Announcement of the crude advance Nov. 2 by Continental Oil Co. had little effect on the market until the advance was met later that day by the major buyers in the Mid-Continent. Even then the price range showed little change although there was a definitely stronger undertone to the market.

A majority of refiners withdrew quotations for gasoline as soon as such majors as Stanolind Crude Oil Purchasing Co., Carter Oil Co. and Humble Oil & Refining Co. advanced crude prices. Other refiners continued to quote unchanged prices for spot business but in many instances accepted only a small amount of business.

Reports received here, meanwhile, indicated that there was little gasoline available in the Chicago market with the possible exception of some gasoline moving in from borderline territory.

With this situation prevailing refiners generally sat back to await some development in the retail gasoline price structure. It is generally believed that Standard of Indiana for many months has based its retail gasoline prices on the cost of crude plus the cost of transporting and refining the oil. With an advance in crude prices it was generally believed Standard of Indiana would make some change in retail prices.

The market marked time Tuesday, Wednesday and Thursday. Buying was mostly of a routine nature and the bulk of shipments from the Mid-Continent were applied against contracts. Jobbers were reported more active in several sections, an indication that they also expected some change in retail prices.

When the 1-cent tank wagon advance was announced Thursday afternoon as effective Friday, Nov. 6, refiners for the most part immediately advanced quotations 0.25 to 0.50 cent.

These price advances brought about the usual situation of refiners and jobbers settling down to a waiting game. Jobbers remained out of the market as much as possible and refiners apparently were content to accept business as it came.

The market was in comparatively good shape late in the week with little gasoline available under the new prices. This gasoline was in the hands of brokers who had bought before the advances, and the volume was so small that it was not representative of the new market levels.

Advances in crude and the refined oils markets had little immediate effect on natural gasolines. Manufacturers generally reported being in excellent shape as far as stocks were concerned and the end of the month selling was not of sufficient volume to swing prices downward materially. New buying was in sufficient volume most of the week to keep the market on an even keel.

Late in the week inquiries were reported more numerous and demand for grade AA improved to the extent the material was scarcer in Oklahoma. Some sales were made at 4.75 cents before the end of the week.

Kerosene demand showed some improvement during the week with prices making a slight advance. An inquiry for a small quantity of kerosine for export was reported circulated in the field, and one company was reported to have purchased 100 cars in north Texas.

That purchase tightened the market considerably in the Wichita Falls district. In the Louisiana and Arkansas districts demand was sufficient to keep most refiners behind on orders.

Distillates were active in several quarters although prices generally were unchanged. Zero gas oils were extremely scarce for immediate shipment. Buyers reported the majority of refiners were sold up for November.

Fuel oils were in slightly better demand, particularly the low cold test grades. Buying was not sufficient, however, to cause more than minor fluctuations in prices.

High gravity zero fuel oils were scarce buyers reported. Refiners making those oils for the most part were contracted for the winter.

Slight changes were made in neutral oils prices but these changes were for the most part within the general range which has been carried for some time. Bright stocks were not as active but no changes were noted in prices.

Chicago Tank Car Market

CHICAGO, Nov. 7

TANK car gasoline prices advanced 0.25 to 0.5 cent in the Chicago market last week, under the stimulus of advances in retail gasoline and crude oil prices. U. S. Motor, below 57 octane, generally was offered at 4.25 to 4.5 cents prior to Nov. 6 and at 4.5 to 4.75 cents after that.

Some Motor, originating mostly in Pennsylvania, was sold at 0.375 to 0.5 cent under these prices for delivery into Indiana, Ohio and Michigan. Most of this gasoline was reported off the market by the end of the week. Spot tank car demand was reported good early in the week and again showed a pick-up following the tank wagon advance.

Kerosines were steady and prices moved higher. Distillates, gas and fuel oils retained their strong positions.

Following prices represent majority of sales to jobbers on Group 3 freight basis, although shipments may originate in other refining districts such as North, West and East Texas, Louisiana, Arkansas, Indiana, Illinois, Kentucky, etc.

	Prices Nov. 9	Prices Nov. 2	Prices Oct. 26
50-52, 437 e.p. naphtha	3.625– 3.75	3.25 – 3.375	3.125– 3.25
U. S. Motor Gasoline:			
Below 57 octane number	4.50 – 4.75	4.25 – 4.375	3.75 – 4.00
57-65 octane number	4.75 – 5.00	4.375– 4.50	4.00 – 4.25
Above 65 octane number	5.00 – 5.25	4.625– 4.75	4.25 – 4.50
60-62, 437 e.p. gasoline	4.625– 4.75	4.25 – 4.375	3.875– 4.00
60-62 400 e.p. gasoline	4.75 – 4.875	4.25 – 4.50	4.00 – 4.25
64-66 375 e.p. gasoline	5.00 – 5.25	4.50 – 4.75	4.50 – 4.625
68-70 350-360 e.p. gasoline	†5.50 – 5.75	†5.125– 5.25	4.875– 5.125
*Domestic Aviation Gasoline	5.75 – 6.00	5.25 – 5.50	5.00 – 5.25
41-43 w.w. kerosine	2.125– 2.25	2.00 – 2.125	2.00 – 2.125
42-44 w.w. kerosine	2.25 – 2.375	2.25 – 2.375	2.25
38-40 p. w. distillate	1.875– 2.00	1.75 – 1.875	1.75 – 1.875
38-40 straw distillate	1.75 – 1.875	1.75 – 1.875	1.75
32-36 ordinary dark gas oil	1.25 – 1.375	1.25 – 1.375	1.25 – 1.375
32-36 dark zero gas oil	1.50 – 1.625	1.50 – 1.625	1.50 – 1.625
32-36 straw zero gas oil	1.625– 1.75	1.625– 1.75	1.625– 1.75
28-30 zero fuel oil (per bbl.)	†$0.475–$0.525	†$0.475–$0.525	†$0.45 –$0.50
28-30 fuel oil (per bbl.)	$0.40 –$0.425	$0.40 –$0.425	$0.35 –$0.40
24-26 fuel oil (per bbl.)	$0.30 –$0.325	$0.30 –$0.325	$0.30 –$0.325
18-22 fuel oil, (per bbl.)	$0.225–$0.25	$0.225–$0.25	$0.225–$0.25
18-22 zero fuel oil (per bbl.)	$0.275–$0.325	$0.275–$0.325	$0.275–$0.325
14-16 fuel oil (per bbl.)	$0.20 –$0.25	$0.20 –$0.25	$0.20 –$0.25

*Prices are based on U. S. Gov't. specifications or better. Present Gov't. specifications require distillation range of 5% recovery at not more than 167° F., and not less than 122° F.; 50% recovery at 221°; 90% at 311°; 96% at 347°; end point 374° F. Gasoline of fighting grade specifications in some instances sells at a premium over domestic aviation grade. Prices represent majority of quotations.

†Nominal.

Fighting Platform Adopted by New National Oil Association

CHICAGO, Nov. 7

A FIGHTING platform has been recommended for the National Independent Oil Association organization of which got under way last week at a meeting in St. Louis. That city was recommended as the place for the national headquarters of the association, secretary of which is C. Y. Hinchey, who was director of the Independent Oil Men of America.

The recommended planks for the new organization of Independent oil men are:

1. Fight against any change of the Sherman anti-trust law or the Clayton act, except to strengthen them.

2. Fight against any further merging of old Standard Oil units.

3. Fight for a fair protective oil tariff.

4. Fight against the general use of lease and agency agreements which are in restraint of trade.

5. Fight against all price dictation, or manipulation, or any so-called "dictator" of the petroleum industry.

6. Fight against the so-called patent pool.

The association has opened its membership to all branches of the petroleum industry but at varying rates for memberships. The fee for a refiner is $200 a year, marketer and royalty owner $100 a year each, associate $25 a year; jobber and compounder $24 each, and service station owner, producer and "subscription" $12 each.

E. H. Hilpp, Louisville Ky., who was president of the I. O. M. A., was elected chairman of the St. Louis meeting. The following committee were appointed:

Organization—A. L. Lommel, Waterloo, Iowa, chairman; Fred E. Bergfors, Quincy, Mass.; Floyd Casey, Waco, Texas, and E. L. Warneke, Webster City, Iowa.

Dues—W. R. McCain, Springfield, Mo., chairman; G. D. Givens, Henderson, Ky.; E. J. Keitel, St. Louis, and J. M. Draughon, Springfield, Tenn.

Objectives—C. Howard Williams, Chicago, chairman; J. O. Abshire, Goshen, Ind.; C. E. Rennie, Traverse City, Mich., and F. A. Muensch, Carlinville, Ill.

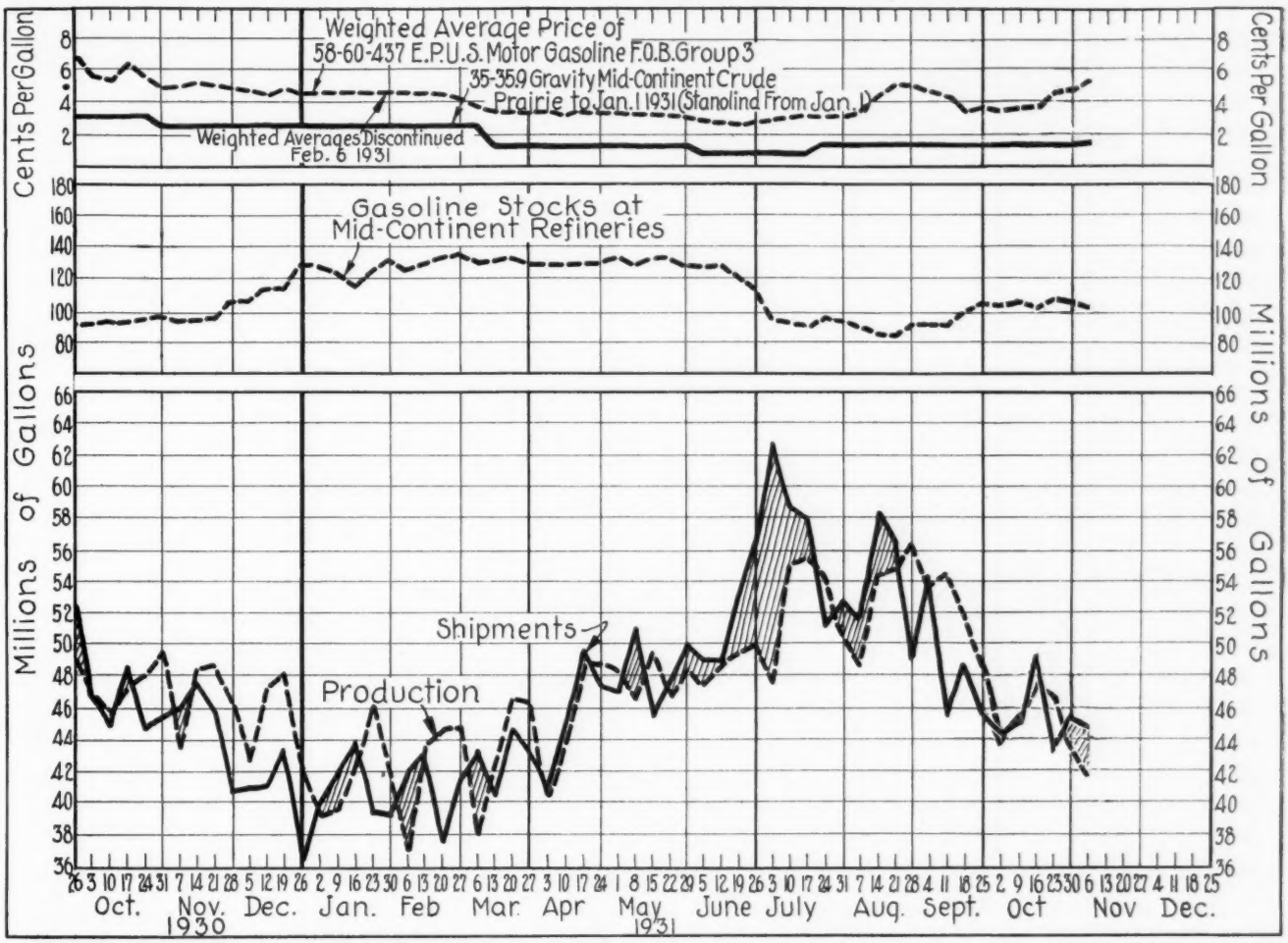
Another meeting at which the organization is to be perfected, will be held within 30 days of March 15, next, it was announced. It was recommended that at the spring meeting the three major branches of the industry should hold group meetings.

February Meeting For Ohio Jobbers

COLUMBUS, O., Nov. 9.—The annual convention and equipment exhibit of the Ohio Petroleum Marketers Association will be held at the Deshler-Wallick Hotel, Columbus, Feb. 23, 24 and 25, according to W. A. Milne, executive secretary.

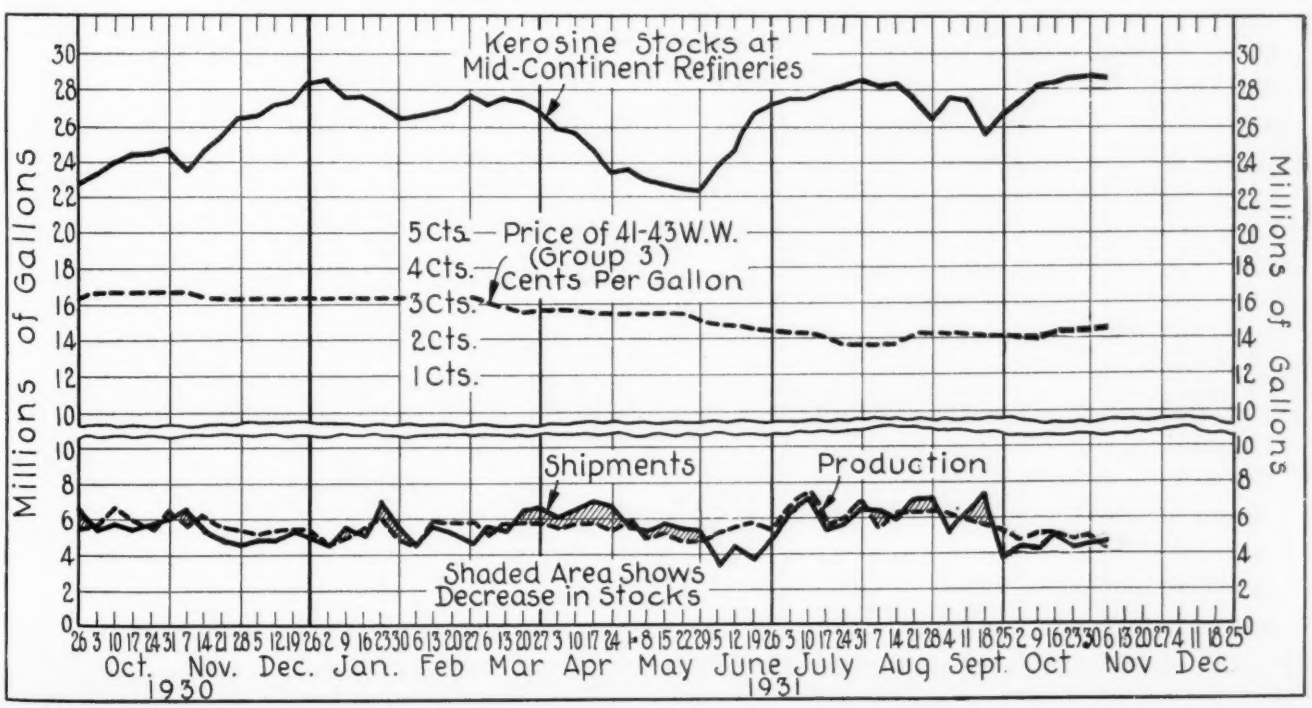
Barometer of Mid-Continent Refinery Market—Week Ending November 6

Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 93 Plants to National Petroleum News


Cents Per Gallon
Weighted Average Price of
58-60-437 E.P.U.S. Motor Gasoline F.O.B. Group 3
35-35.9 Gravity Mid-Continent Crude
Prairie to Jan. 1 1931 (Stanolind From Jan. 1)
Weighted Averages Discontinued Feb. 6 1931
Gasoline Stocks at Mid-Continent Refineries
Millions of Gallons
Shipments
Production
Oct. Nov. Dec. Jan. Feb Mar. Apr May June July Aug. Sept. Oct Nov Dec.
1930
1931

Beginning Oct. 9, 1931, price on U. S. Motor gasoline is average of three grades, classified according to octane number: below 57 octane number, 57-65 octane, and above 65 octane number.

Prices shown above are extended to date shown in Refinery Market and Crude tables in Market section of this issue and stocks, shipments and Production are extended to date as shown in the table on page 82


Kerosine Stocks at Mid-Continent Refineries
Millions of Gallons
5 Cts. Price of 41-43 W.W. (Group 3)
4 Cts. Cents Per Gallon
3 Cts.
2 Cts.
1 Cts.
Shipments
Production
Shaded Area Shows Decrease in Stocks
Oct. Nov. Dec. Jan. Feb Mar Apr May June July Aug Sept. Oct Nov Dec
1930
1931

Beginning Oct. 12, 1931, price on U. S. Motor gasoline is average of three grades, classified according to octane number: below 57 octane number, 57-65 octane, and above 65 octane number.

Refinery Markets on Light Oils and Lubricants

Prices given below are in cents per gallon, except where $ is shown in tank car lots, f.o.b. Refinery. They represent prices made only to domestic jobbers who resell to the consuming public, except where otherwise noted.

(These Refinery Prices compiled in the OIL PRICE HANDBOOK for a whole year)

GASOLINE AND NAPHTHA

OKLAHOMA (F. o. b. Oklahoma refineries)

	Prices Nov. 9	Prices Nov. 2	Prices Oct. 26
50-52 450 e.p. naphtha...	†3.75 – 4.00	†3.375– 3.625	†3.00 – 3.25
U. S. Motor Gasoline			
Below 57 octane number	4.75 – 5.00	4.25 – 4.375	4.00 – 4.25
57-65 Octane number....	5.00 – 5.25	4.50 – 4.625	4.25 – 4.50
Above 65 Octane number	†5.25 – 5.50	†4.75 – 4.875	†4.75
60-62, 400 E.P. Gasoline			
Below 57 Octane number	5.00 – 5.25	4.375– 4.625	4.25 – 4.50
57-65 Octane number....	5.25 – 5.50	4.625– 4.875	4.50 – 4.75
Above 65 Octane number.	5.50 – 5.75	4.875– 5.125	4.75 – 4.875
64-66, 375 E.P. Gasoline			
Below 57 Octane number	5.125– 5.25	4.75 – 4.875	4.625
57-65 Octane number....	5.25 – 5.375	5.00 – 5.125	4.875
Above 65 Octane number	†5.375– 5.625	†5.25 – 5.375	†5.125
68-70 350-360 e.p. gasoline	†5.50 – 5.75	†5.25 – 5.50	5.125– 5.375
‡Domestic Aviation Gasoline.....	5.875– 6.00	5.25 – 5.50	5.25 – 5.50

‡Prices based on U. S. Gov't. specifications or better. Present Gov't. specifications require distillation range of 5% recovery at not more than 167° F., and not less than 122° F., 50% rec. at 221°; 90% at 311°; 96% at 347°; end point, 374° F. Fighting grade in some instances sells at a premium over domestic aviation grade. Prices represent majority of quotations.

PENNSYLVANIA (F. o. b. Western Pennsylvania refineries)

52-54 Naphtha.....	4.00 – 4.25	4.125– 4.25	4.25 – 4.50
54-56 Naphtha.....	4.25 – 4.50	4.25 – 4.50	4.50 – 4.75
58-60 U.S. Motor 437 e.p.	4.375– 4.75	4.25 – 4.50	4.50 – 4.75
60-62 400-410 e.p. gasoline	4.50 – 5.00	4.50 – 4.75	4.625– 5.00
64-66 390 e.p. gasoline...	4.875– 5.125	5.00 – 5.25	5.00 – 5.25
68-70 350-360 e.p.....	5.50 – 6.00	5.625– 6.00	5.625– 6.00

OHIO (Quotations of S. O. Ohio. 4c state tax to be added. Delivered any point in Ohio.)

U. S. Motor Gasoline....	8.25	7.75	7.75
60-65 Octane number....	8.50	8.0	8.00

KANSAS (F. o. b. refinery, Kansas destination)

U. S. Motor Gasoline			
Below 57 Octane number	5.00 – 5.125	†4.50	.25 – 4.50
57-65 Octane number....	5.25 – 5.375	†4.75	†4.50 – 4.75
Above 65 Octane number	5.50 – 5.625	†5.00	†4.75 – 5.00
60-62 400 e.p. gasoline....	5.25 – 5.375	4.75	4.50 – 4.75
64-66 375 e.p. gasoline....	5.375– 5.625	5.00	4.75 – 5.00

NORTH TEXAS (F. o. b. North Texas refineries)

56-58 450 e.p. gasoline...	†4.00 – 4.25	†3.50 – 3.75	†3.50
58-60 450 e.p. gasoline...	†4.00 – 4.25	†3.50 – 3.75	†3.50
U. S. Motor Gasoline			
Below 57 Octane number	4.625– 4.75	4.00 – 4.25	4.00 – 4.125
57-65 Octane number....	4.875– 5.00	4.25 – 4.50	4.25 – 4.375
Above 65 Octane number	5.125– 5.25	4.50 – 4.75	4.50 – 4.625
60-62 400 e.p. gasoline...	4.875– 5.00	4.25 – 4.75	4.25 – 4.75
64-66 390 e.p. gasoline...	4.875– 5.125	4.50 – 4.875	4.50 – 4.75
64-66 375 e.p. gasoline...	5.00 – 5.25	4.625– 4.875	4.625– 4.875
68-70 350-360 e.p. gasoline	5.375– 5.50	5.00 – 5.125	4.875– 5.125

****WEST TEXAS** (F. o. b. West Texas refinery, for unrestricted shipment)

U. S. Motor Gasoline			
Below 57 Octane number	4.625– 4.75	4.25	4.00 – 4.125
57-65 Octane number....	4.875– 5.00	4.25 – 4.50	4.25 – 4.375
Above 65 Octane number	5.125– 5.25	4.75	4.50 – 4.625

NORTH LOUISIANA (N. La., Ark. and Miss. destination)

U. S. Motor Gasoline			
Below 57 Octane number	5.00	4.50	4.25
57-65 Octane number....	†5.25	†4.75	†4.50
Above 65 Octane number	†5.50	†5.00	†4.75

ARKANSAS (Ark., N. La., and Miss. destination)

U. S. Motor Gasoline			
Below 57 Octane number	5.00	4.50	4.25
57-65 Octane number....	†5.25*	†4.75	†4.50
Above 65 Octane number	†5.50	†5.00	†4.75

CALIFORNIA (3c tax to be added to California gasoline prices if used n state.)

§ 4-58 U.S. Motor 437 e.p.	6.50 – 8.50	6.00 – 8.50	6.00 – 8.50
54-58 U.S. Motor, for outside state shipment....	5.75 – 6.50	5.75 – 6.50	5.75 – 6.50
58-61 375-400 e.p. gasoline	9.50 –10.50	9.50 –10.50	9.50 –10.50
42-45 Engine Distillate 445-480 e.p.....	7.00 – 8.00	7.00 – 8.00	7.00 – 8.00

†Prices nominal ††Only one refiner quoting *Quotations only

NATURAL GASOLINE

End point of all grades, not over 375F.

OKLAHOMA (F. o. b. Group 3)

	Prices Nov. 9	Prices Nov. 2	Prices Oct. 26
Grade AA, 80-87.9, 90% Recovery.....	4.50	4.50	4.75
Grade A, 72-79.9, 90% Recovery.....	†4.75 – 5.00	†4.75	†4.875– 5.00
Grade BB, 84-92, 85% Recovery.....	†4.50	†4.50	†4.75
Grade B, 76-83.9, 85% Recovery.....	†4.50	†4.50	†4.75
Grade C, 80-92, 78% Recovery.....	†4.50	†4.50	†4.75
Grade 26-70.....	4.50	4.50	4.75

NORTH TEXAS (F. o. b. Breckenridge)

Grade AA, 80-87.9, 90% Recovery.....	4.25	4.25	4.50 – 4.625
Grade A, 72-79.9, 90% Recovery.....	†4.50	†4.50	†4.75
Grade BB, 84-92, 85% Recovery.....	†4.25	†4.25	†4.50 – 4.625
Grade B, 76-83.9, 85% Recovery.....	†4.25	†4.25	†4.50 – 4.625
Grade C, 80-92, 78% Recovery.....	†4.25	†4.25	†4.50 – 4.625
Grade 26-70.....	4.25	4.25	4.50 – 4.625

NORTH LOUISIANA (F. o. b. Monroe District)

Grade AA.....	†4.50	†4.50	†4.75
Grade BB.....	†4.50	†4.50	†4.75
Grade C.....	†4.50	†4.50	†4.75

CALIFORNIA (F. o. b. California refineries)

75-85, 375-390 e.p. for blending.....	5.75 – 6.25	5.75 – 6.25	5.75 – 6.25

BURNING OILS

PENNSYLVANIA (F. o. b. Western Pennsylvania refineries)

45 w.w. kerosine.....	3.625– 3.875	3.625– 3.875	3.625– 3.75
46 w.w. kerosine.....	3.75 – 4.00	3.75 – 4.00	3.75 – 4.00
47 w.w. kerosine.....	4.00 – 4.25	4.00 – 4.25	4.00 – 4.25

OKLAHOMA (F. o. b. Oklahoma refineries)

41-43 w.w. kerosine.....	2.125– 2.25	2.00 – 2.25	2.00 – 2.25
42-44 w.w. kerosine.....	2.25 – 2.375	2.125– 2.375	2.125– 2.375

KANSAS (F. o. b. refinery Kansas destination)

41-43 w.w. kerosine.....	2.50 – 2.625	2.50 – 2.625	2.375– 2.50
42-44 w.w. kerosine.....	2.625– 2.75	2.625– 2.75	2.50 – 2.75

NORTH TEXAS (F. o. b. North Texas refineries)

40-42 w.w. kerosine.....	†2.125	†2.00 – 2.125	†2.00 – 2.125
41-43 w.w. kerosine.....	†2.25	†2.125– 2.25	†2.125– 2.25

NORTH LOUISIANA (N. La., Ark. and Miss. destination)

41-43 w.w. kerosine.....	2.75 – 3.00	2.75	2.75

ARKANSAS (Ark., N. La. and Miss. destination)

41-43 w.w. kerosine.....	2.75 – 3.00	2.75	2.75

CALIFORNIA (F. o. b. California refineries)

38-40 w.w. kerosine.....	4.00 – 5.00	4.00 – 5.00	4.00 – 5.00

NEUTRAL OIL

PENNSYLVANIA (F. o. b. Western Pennsylvania refineries)

Vis.	(Viscosity at 70° F.)		
200 No. 3 color, 420-425 flash.....	21.00 –22.00	21.50 –22.00	21.50 –22.00
180 No. 3 color, 410-415 flash.....	19.50 –20.00	19.50 –20.00	†19.50 –20.00
150 No. 3 color, 400-405 flash.....	17.00 –17.50	17.00 –17.50	17.50 –18.00

Note: Refiners quote 4 to 6c higher for 0 to 10 pour test oils; 3 to 5c higher for 10 to 15 pour test oils than prices shown above on this date.

****Prices represent quotations and sales**

Refinery Markets Wax, Lubricants, Heavy Oil

Prices given below are in cents per gallon, except where $ is shown in tank car lots, f.o.b. Refinery. They represent prices made only to domestic jobbers who resell to the consuming public, except where otherwise noted.

(For quick reference to Refinery Prices, get the OIL PRICE HANDBOOK, published annually)

****MID-CONTINENT** (F. o. b. Mid-Continent refineries)

Vis. Color	Prices Nov. 9 (Viscosity at 100° F.) 0 to 10 Pour Point	15 to 30 Pour Point	Prices Nov. 2 0 to 10 Pour Point	15 to 30 Pour Point
100—No. 2...	4.75	4.00	4.75	4.00
150—No. 3...	7.00 – 7.25	6.75	7.00 – 7.25	6.75
150—No. 4...	6.75	6.25	6.75	6.25
180—No. 3...	8.25 – 8.75	8.25	8.25 – 8.75	8.25
180—No. 4...	8.25	8.00	8.25	8.00
180—No. 5...	7.50	7.00	7.50	7.00
200—No. 3...	9.50 –10.00	9.00 – 9.25	9.50 –10.00	9.25 – 9.50
200—No. 4...	9.25 – 9.50	9.00	9.25 – 9.50	9.00
200—No. 5...	9.00 – 9.25	8.50	9.00 – 9.25	8.50
220—No. 3...	9.75	9.50	9.75	9.50
220—No. 4...	9.50	9.00	9.50	9.00
220—No. 5...	9.25	8.75	9.25	8.75
240—No. 3...	11.00 –11.50	11.00	11.00 –11.50	11.00
240—No. 4...	10.75	10.25	10.75	10.25
240—No. 5...	10.50	10.00	10.50	10.00
280—No. 3...	13.00	12.50	13.00	12.50
280—No. 4...	12.00	11.50	12.00	11.50
280—No. 5...	11.75	11.25	11.75	11.25

GULF COASTAL (F. o. b. Gulf Coastal refineries)

Vis. Color	Prices Nov. 9 (Viscosity at 100° F., pour test 0)	Prices Nov. 2	Prices Oct. 26
100—No. 2 Pale.....	5.25 – 5.50	5.00 – 5.25	5.00 – 5.25
200—No. 3 Pale.....	7.25 – 7.50	7.00 – 7.25	7.00 – 7.25
300—No. 3 Pale.....	8.25 – 8.50	8.00 – 8.25	8.00 – 8.25
500—No. 3½ Pale.....	9.25 – 9.50	9.00 – 9.25	9.00 – 9.25
750—No. 4 Pale.....	10.25 –10.50	10.00 –10.25	10.00 –10.25
1200—No. 4 Pale.....	12.25 –12.50	12.00 –12.25	12.00 –12.25
2000—No. 4-5 Pale.....	13.25 –13.50	13.00 –13.25	13.00 –13.25
200—No. 5½ Red Oil...	6.25 – 6.50	6.00 – 6.25	6.00 – 6.25
300—No. 5½ Red Oil...	7.25 – 7.50	7.00 – 7.25	7.00 – 7.25
500—No. 6 Red Oil.....	8.25 – 8.50	8.00 – 8.25	8.00 – 8.25
750—No. 6 Red Oil.....	9.25 – 9.50	9.00 – 9.25	9.00 – 9.25
1200—No. 5-6 Red Oil...	11.25 –11.50	11.00 –11.25	11.00 –11.25
2000—No. 5 Plus Red,Oil	13.25 –13.50	13.00 –13.25	13.00 –13.25

CALIFORNIA (F. o. b. California refineries)

Vis. Color	(Viscosity at 100° F.)		
100—No. 3.....	8.00	8.00	8.00
200—No. 3.....	10.00	10.00	10.00
300—No. 3.....	10.50	10.50	10.50
450—No. 3.....	12.00	12.00	12.00
550—No. 3.....	13.50	13.50	13.50
600—No. 3.....	13.50	13.50	13.50
200—No. 5.....	10.00	10.00	10.00
300—No. 5.....	10.50	10.50	10.50
400—No. 5.....	12.00	12.00	12.00
500—No. 5.....	13.00	13.00	13.00
600—No. 5.....	13.50	13.50	13.50
700—No. 7.....	13.50	13.50	13.50

CYLINDER STOCKS

MID-CONTINENT (F. o. b. Mid-Continent refineries)
(Prices represent quotations and sales).

190-200 Vis. D at 210° Brt. St.....	20.50 –22.00	20.50 –22.00	20.50 –22.00
150-160 Vis. D at 210° Brt. St., 0-10 cold test	20.00 –20.50	20.00 –20.50	20.00 –20.50
150-160 Vis. D at 210° Brt. St., 10-25 cold test	19.50 –20.00	19.50 –20.00	19.50 –20.00
150-160 Vis. D Brt. Stock, 25-40 cold test.....	18.50 –19.00	18.50 –19.00	18.50 –19.00
150-160 Vis. E 210° Brt. St.....	19.00	19.00	19.00
600 St. Ref. Olive Green..	5.50 – 6.50	5.50 – 6.50	5.50 – 6.50
600 St. Ref. Dark Green..	4.50 – 5.50	4.50 – 5.50	4.50 – 5.50
Black Oil.....	3.25 – 4.00	3.25 – 4.00	3.25 – 4.00

PENNSYLVANIA (F. o. b. Western Penna. refineries) (A.S.T.M. Tests)

600 Steam Refined, filterable.....	13.50 –14.00	13.75 –15.00	14.00 –15.00
650 Steam Refined.....	16.50 –17.50	17.50 –18.00	17.50 –18.00
600 Flash.....	18.00 –19.00	20.00 –21.00	20.00 –21.00
630 Flash.....	21.00 –23.00	23.00 –24.00	23.50 –24.50
600 Warren E.....	17.00 –18.00	17.75 –18.00	18.00 –18.50
Cold Test Stocks, 140-150 vis. at 210°, 540-550 flash, No. 8 color:			
20 pour test and below	25.00 – 27.00	27.00 –28.50	28.00 –29.00
25 and 35 pour test....	23.00 – 24.00	24.00 –25.00	25.50 –26.00
40 pour test and above..	23.00 – 23.50	24.00 –25.00	†25.50 –26.50

WAX

PENNSYLVANIA (Per pound, F. o. b. New York)

122-124 white crude scale a.m.p.....	2.00 – 2.125	2.00 – 2.125	2.00 – 2.125
124-126 white crude scale, a.m.p.....	2.00 – 2.125	2.00 – 2.125	2.00 – 2.125

†Prices nominal ††Only one refiner quoting *Quotations only

****OKLAHOMA** (Per pound in barrels; in a few instances, per pound in burlap bags; F. o. b. Oklahoma refineries.)

	Prices Nov. 9	Prices Nov. 2	Prices Oct. 26
124-126 White Crude Scale, a.m.p.....	1.75 – 1.875	1.75 – 1.875	1.75 – 1.875

DISTILLATE, GAS AND FUEL OIL

PENNSYLVANIA (For outside Pittsburgh district)

36-40 fuel oil.....	2.50 – 3.00	2.625– 3.125	2.625– 3.00

OKLAHOMA (F. o. b. Oklahoma refineries)

38-40 straw distillate.....	1.875– 2.00	1.875	1.75 – 1.875
36-38 straw distillate.....	†1.75 – 1.875	†1.75	†1.625– 1.75
32-36 straw gas oil.....	1.375– 1.50	1.375– 1.50	1.375– 1.50
32-36 straw gas oil zero...	†1.75 – 1.875	†1.75 – 1.875	†1.625– 1.875
32-36 dark gas oil.....	1.375– 1.50	1.375– 1.50	1.375– 1.50
32-36 dark gas oil zero...	†1.75 – 1.875	†1.75 – 1.875	†1.625– 1.875
28-30 zero fuel oil(per bbl.)	$0.525–$0.55	$0.50 –$0.525	$0.50 –$0.525
28-30 fuel oil (per bbl.)...	$0.425–$0.45	$0.40 –$0.45	$0.40 –$0.45
26-28 fuel oil (per bbl.)...	$0.375–$0.40	$0.375–$0.40	$0.375–$0.40
24-26 fuel oil (per bbl.)...	$0.35 –$0.375	$0.35 –$0.375	$0.35 –$0.375
22-26 fuel oil (per bbl.)...	$0.325–$0.35	$0.325–$0.35	$0.325–$0.35
18-22 fuel oil (per bbl.)...	$0.30 –$0.325	$0.30 –$0.325	$0.30 –$0.325
16-20 fuel oil (per bbl.)...	$0.275–$0.30	$0.275–$0.30	$0.275–$0.30
14-16 fuel oil (per bbl.)...	$0.225–$0.25	$0.225–$0.25	$0.225–$0.25

KANSAS (F. o. b. refinery Kansas destination)

38-40 straw distillate.....	2.125– 2.25	2.125– 2.25	2.00 – 2.125
36-38 straw distillate.....	2.00 – 2.125	2.00 – 2.125	1.875– 2.00
32-36 straw gas oil.....	1.875– 2.00	1.875– 2.00	1.75 – 2.00
18-22 fuel oil (per bbl.)...	$0.40 –$0.50	$0.35 –$0.40	$0.35 –$0.40
10-14 fuel oil (per bbl.)...	$0.35 –$0.45	$0.325–$0.35	$0.325–$0.35

NORTH TEXAS (F. o. b. North Texas refineries)

38-40 straw distillate....	†1.875	†1.875	†1.875
38-40 p.w.treated distillate	†1.875– 2.00	†1.875– 2.00	†1.875– 2.00
32-36 gas oil, cracked.....	1.375	1.375	1.25 – 1.375
32-36 St. reduced gas oil..	1.375	1.375	1.25 – 1.375
24-26 fuel oil (per bbl.)...	$0.35 –$0.375	$0.35 –$0.375	$0.35 –$0.375
20-24 fuel oil (per bbl.)...	$0.30 –$0.325	$0.30 –$0.325	$0.30 –$0.325
18-22 fuel oil (per bbl.)...	$0.275–$0.30	$0.275–$0.30	$0.275–$0.30

****WEST TEXAS** (F. o. b. West Texas refinery, for unrestricted shipment)

30-32 gas oil.....	†1.375	†1.375	†1.25 – 1.375
28-30 zero gas oil.....	†1.375	†1.375	†1.25 – 1.375
18-22 fuel oil (per bbl.)...	$0.275–$0.30	$0.275–$0.30	$0.275–$0.30

NORTH LOUISIANA (N. La., Ark. and Miss. destination)

32-36 gas oil.....	2.00	1.75	1.75
32-36 gas oil, zero.....	2.25	2.00	2.00
14-16 fuel oil (per bbl.)...	$0.40 –$0.45	$0.40 –$0.45	$0.40 –$0.45

ARKANSAS (Ark., N. La. and Miss. destination)

32-36 gas oil.....	2.00	1.75	1.75
32-36 gas oil, zero.....	2.25	2.00	2.00
28-30 gas oil.....	†1.75	†1.75	†1.75
20-24 fuel oil (per bbl.)...	$0.525–$0.55	$0.50 –$0.55	$0.50 –$0.55
9-12 fuel oil (per bbl.)...	$0.425–$0.45	$0.375–$0.425	$0.375–$0.425
Black oil.....	3.00	3.00	3.00

CALIFORNIA (F. o. b. San Joaquin Valley. Nominal pipe line charge to San Francisco 24c per bbl. more and to San Pedro 20c per bbl. more.)

14-18 fuel oil (per bbl.)...	$0.45 –$0.55	$0.40 –$0.55	$0.45 –$0.55
14-18 Bunker oil (per bbl.)	$0.55 –$0.75	$0.50 –$0.75	$0.50 –$0.75
30-34 gas oil (per bbl.)...	$0.80 –$0.95	$0.80 –$0.95	$0.75 –$0.90
27 Plus Diesel oil (per bbl.)	$0.80 –$0.95	$0.80 –$0.95	$0.75 –$0.90

PETROLATUMS

PENNSYLVANIA (Per pound, in barrels, carload lots, f. o. b. Penna. refinery. In tank cars ⅝c to ¾c per pound less.) Quotations are from majority of refiners.

Snow White.....	6.75 – 7.50	6.75 – 7.50	6.75 – 7.50
Lily White.....	5.75 – 6.50	5.75 – 6.50	5.75 – 6.50
Cream White.....	4.75 – 5.50	4.75 – 5.50	4.75 – 5.50
Light Amber.....	2.625– 3.25	2.625– 3.25	2.625– 3.25
Amber.....	2.375– 3.00	2.375– 3.00	2.375– 3.00
Red.....	2.00 – 2.75	2.00 – 2.75	2.00 – 2.75

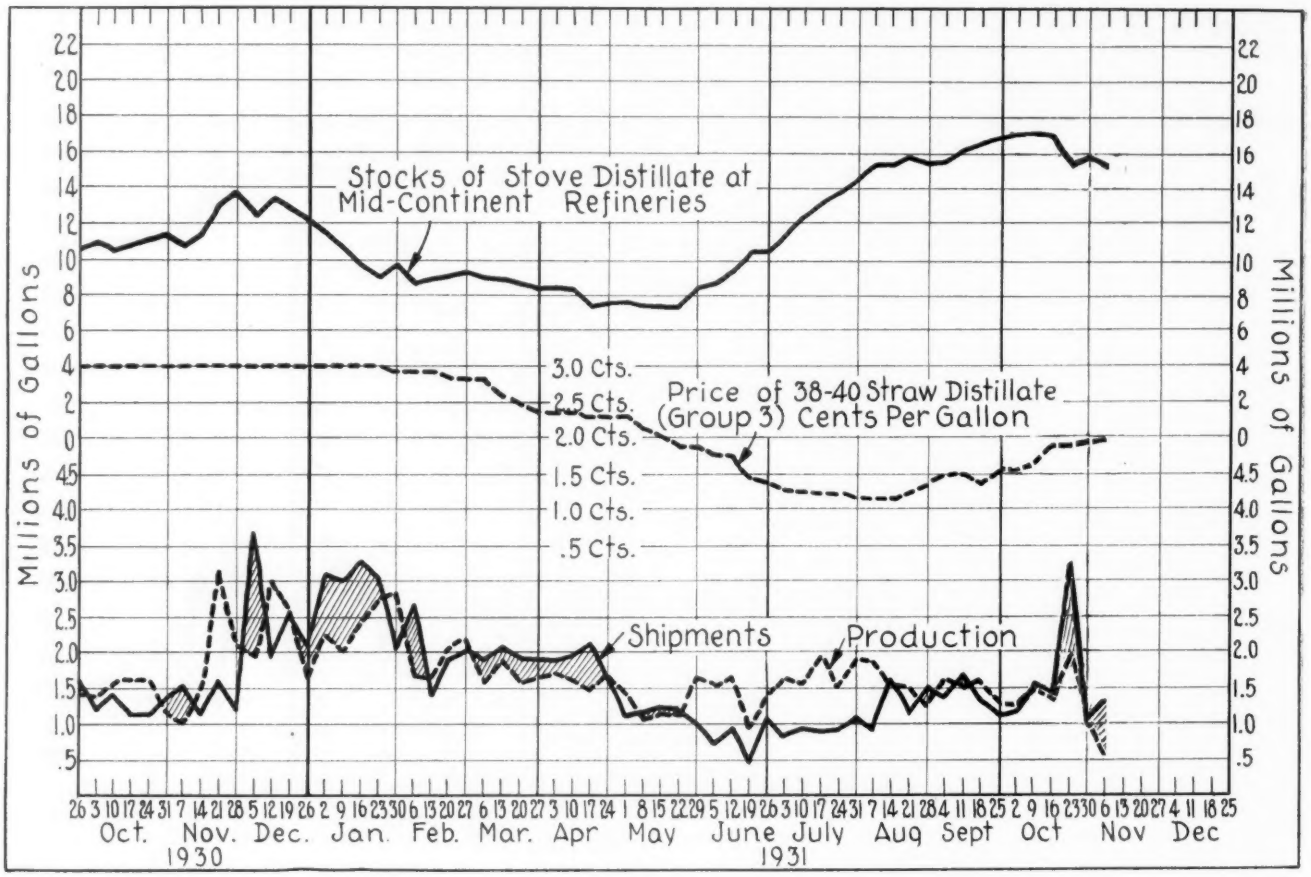
PETROLEUM COKE

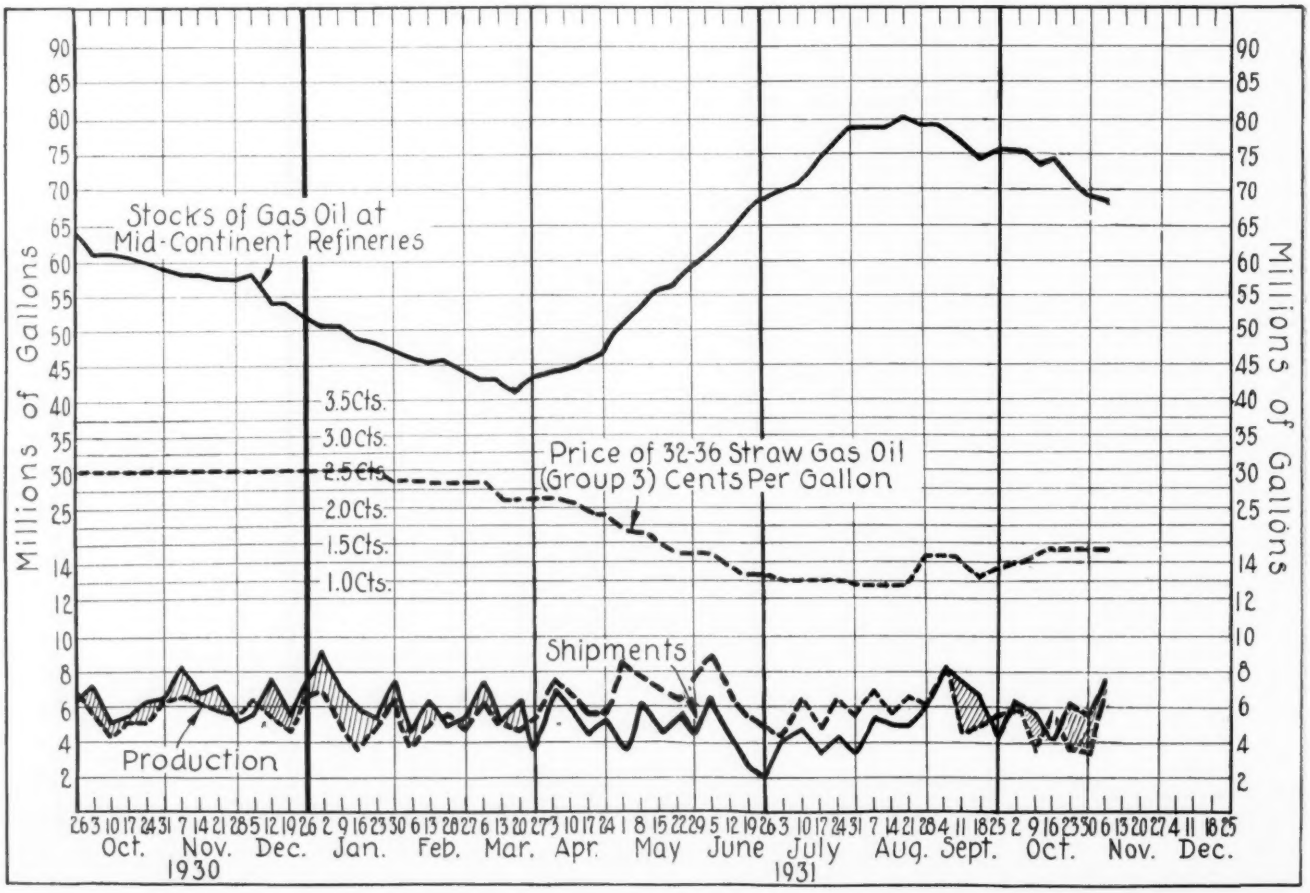
****OKLAHOMA** (F. o. b. Oklahoma refineries)
(Per ton in car lots)

Lump.....	$3.00 –$4.00	$3.00 –$4.00	$3.00 –$4.00
Still run.....	$2.00	$2.00	$2.00
Breeze.....	$0.75 –$1.50	$0.75 –$1.50	$0.75 –$1.50

Barometer of Mid-Continent Refinery Market—Week Ending November 6

Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 93 Plants to National Petroleum News





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60/65 @ 210	Below 0° F.
75/80 @ 210	Below 0° F.
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Barometer of Mid-Continent Refinery Market—Week Ending November 6

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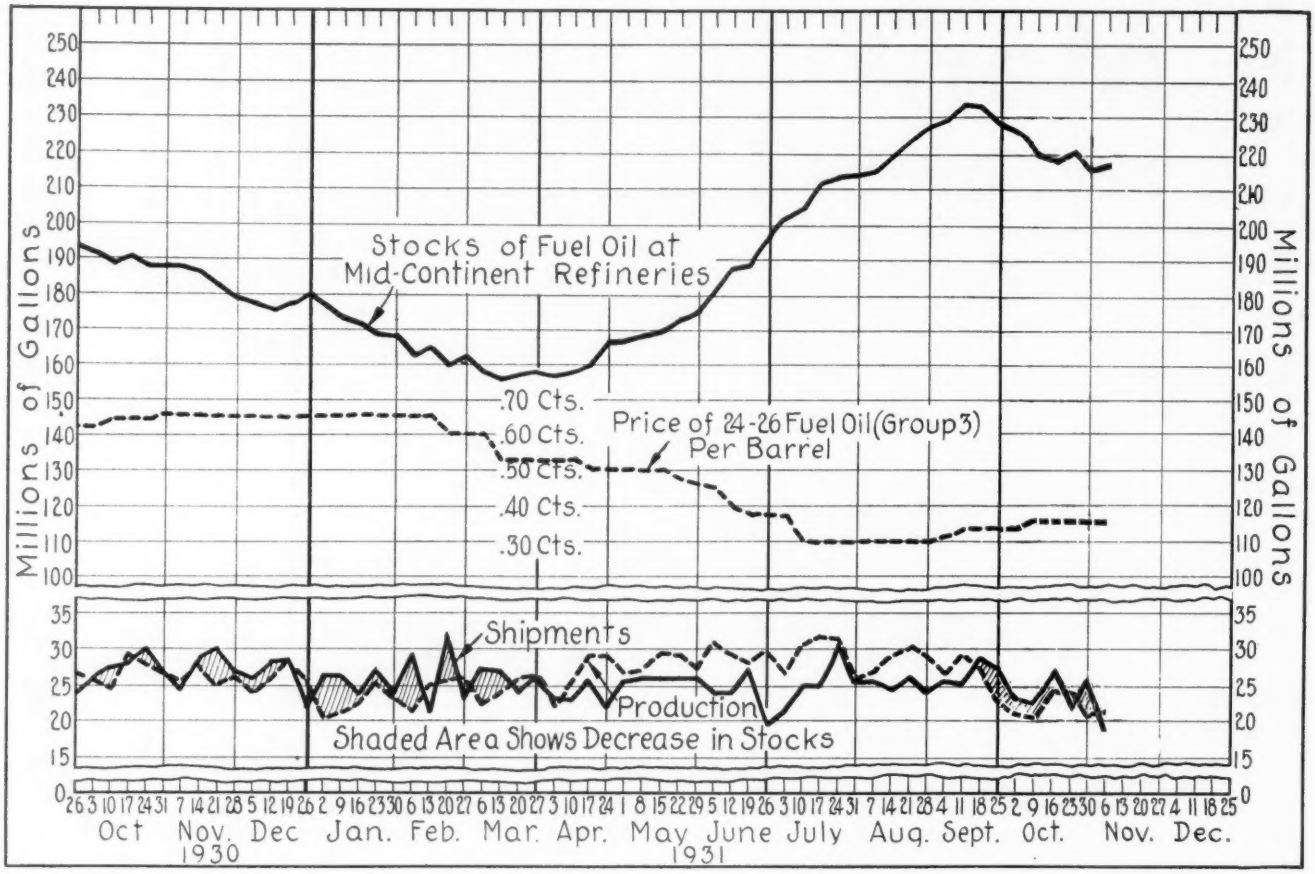

California Refinery Market

Export and Domestic Markets Unchanged

LOS ANGELES, Nov. 7—THE position of California export and domestic markets the past week was practically unchanged from that of a week ago. While east coast buyers continued to indicate interest in local bulk quotations for gasoline, there was little chance of immediate business in the face of prices at the Gulf.

One trader reported an exploratory inquiry for a cargo lot of U. S. Motor gasoline, 65 octane number, with the buyer indicating price of about 3.5 cents. It was thought not possible to shade 4 cents for this gasoline although this figure is nominal, most suppliers apparently being willing to wait for rising tank car markets on the Atlantic seaboard.

Oriental demand for cased goods was reported good, with c.i.f. quotations of 13 cents and $1.45 to $1.55 prevailing on U. S. Motor gasoline and 38-40 water white kerosine, respectively. A large supplier was reported to have underbid quotations on gasoline with a price of 12.5 cents c.i.f. a Japanese port on a quantity of 3000 cases.

Opening of bids on some 500,000 barrels of bunker C fuel oil for government operations in the Panama Canal indicated Huastica Petroleum Corp. was low with a bid of $0.58 a barrel on 300,000 barrels for delivery to Cristobal on the Atlantic side. West India Oil Co. was next in line with $0.60 and was followed by Asiatic Petroleum who bid $0.65.

West India was low bidder, with a figure of $0.73, on approximately 200,000 barrels for delivery to Balboa on the Pacific side. The Texas Co. was second with $0.75 and Associated Oil Co. third with $0.76. West India specified Venezuela oil for Balboa.

California domestic markets were quiet with tank car and tank truck and trailer quotations for gasoline only slightly higher. Independent refiners advanced prices 0.5 cent to 9.5 cents on tank and trailer deliveries within the state. The price includes the state tax. Major refiners continued to ask 11.5 cents for this movement. Retail gasoline prices in the Los Angeles Basin ranged from 10.5 cents on independent "no-brand" products to 16 cents on major brands, with other independents falling in line between these extremes with prices of 12.5 to 14 cents.

Gasoline for movement into the adjoining states of Utah and Arizona was quoted at 5.75 to 6.25 cents with indications of a 0.25 cent advance as soon as conditions warrant.

Quotations for other California commodities were practically unchanged.

DENVER, Colo.—Dwight F. Benton, who was sales promotion manager in the Rocky Mountain division of the Standard Oil Co. of Indiana, recently was appointed assistant manager of the division with headquarters in Denver. F.L. Cochran is head of the division. His title is assistant general manager of the sales department of the company.

Pennsylvania Markets

Improvement in Mid-West Spreads to Pennsylvania

CLEVELAND, Nov. 9.—Optimism and general improvement prevailing in the Mid-Continent spread to the western Pennsylvania refinery market last week. Trading of some commodities in the latter market was unusually active. Lubricating oils generally lost considerable ground. Viewing the market as a whole, however, the price situation was little changed. Advances in light oils offset to a great extent the reductions in heavy oil prices.

Gasoline and kerosine were in the limelight from the standpoint of activity. The demand for kerosine was the usual seasonal activity getting underway combined with increased use of this product in cracking.

The wave of gasoline buying which hit the market was wholly unexpected. Prices in the Mid-Continent had risen to the extent that middle western buyers found it to their advantage to turn to Pennsylvania. This buying hit Pennsylvania at a most opportune time. The market was just beginning to be flooded with distress offerings, and concessions in prices were being made right and left. Large lots of gasoline were sold to resale agents in Chicago and also smaller lots to jobbers in the middle western territory. Demand from both continued at a rate that warranted advancing prices, and the market in Pennsylvania turned about face.

At the end of the week there was very little U. S. Motor gasoline being offered to the car unloader at under 4.375 cents, whereas earlier in the week large sales had been made at 4 cents a gallon and less.

There was considerable talk among the trade late in the week that Atlantic Refining Co. would shortly advance retail prices in Pennsylvania. Jobber buying in the Atlantic territory was stimulated to some extent by these reports. Some refiners reported jobbers were buying from them for future delivery for the first time in many weeks.

Effect of the recent reduction in Pennsylvania crude oil prices became apparent in the steadily declining prices for cylinder stocks, bright stocks and neutral oils. Buying of these oils was light and prices were down from 1 to 1.5 cents per gallon over the week.

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These rugged, full steel mounted units will outlast your truck. Each compartment is separate and distinct from the other. Capacities range from 300 to 2,000 gallons.

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Eastern Domestic Markets

Prices Reflect Improvement in Other Areas

Staff Special
NEW YORK, Nov. 7

GASOLINE markets on the east coast the pastweek began to reflect the advances in prices in the Mid-Continent and Gulf markets. As the week ended, two refiners advanced their prices 0.5 cent at all seaboard points. Other active sellers announced 0.25 cent advances to be effective Nov. 9.

Kerosine prices were advanced 0.5 cent to 5.50 cents by major suppliers at all principal marketing points.

The Atlantic Refining Co. announced that effective Nov. 9 it was advancing the service station price of gasoline 1 cent at Philadelphia making the new price 11 cents.

Trading in the New York harbor market increased the latter part of the week. By far the majority of sales of gasoline with an octane number of 65 or better were made at 5.50 cents. Several active sellers reported that replacement costs would be higher and that an advance of a 0.25 cent in tank car prices would be forthcoming considering the approach of the off-season. Consumption has held up remarkably well. Demand in the wholesale market coupled with a reduction in the crude runs to stills at refineries has kept gasoline stocks in much better balance than has existed for many months. Marketers generally displayed an improved feeling.

In the Philadelphia market sales at lower price levels were less numerous. Demand was reported fair. Prices were steady at 5.25 and 5.5 cents for the lower and higher octane grades, respectively.

Trading in the Baltimore gasoline market revealed sales at prices ranging from 5.25 to 5.75 cents in tank cars. Barge prices were advanced by one company to 5.25 cents. Little barge activity was reported after a few sales made early in the week.

Spot activity in the New England markets was light; a sizable movement against contracts was reported by several suppliers. The belief was widely entertained that an advance in retail prices would soon be announced.

Colder weather in Boston stimulated the buying of heating oils. Prices were steady in this market. A little price shading was reported in the New York harbor market, but the majority of prices were steady at 4.5 cents for No. 1 oil and 3.5 cents for No. 2 oil.

Kerosine was the outstanding commodity on the seaboard in the recent advance in prices. The 5.5-cent tank car price was steady and was quoted by the majority of sellers. Some off-color material was available at 5 cents in the Baltimore market.

Bunker oil was posted at $0.60 per barrel at New York harbor. Diesel oil was likewise posted at an unchanged price—$1.30 per barrel. The market for both grades of oil were steady at those figures.

Gulf Coast Markets

Prices Higher; Trading Quiet

Staff Special
NEW YORK, Nov. 7

BULK gasoline and kerosine prices at the Gulf were advanced on 0.125 to 0.75 cent by refiners during the week ended Nov. 7. No foreign business was in the market, but numerous inquiries were circulated by domestic buyers of gasoline. One cargo of water white kerosine was reported sold at 3.75 cents for coastwise shipment.

Quotations for gasoline for domestic shipment ranged from 4.25 to 4.75 cents. No sales were reported. The export grades of gasoline were likewise quoted higher. U. S. Motor was priced at 4 cents, 60-62, 400 end point at 4.125 cents; 61-63, 390 end point at 4.25; and 64-66, 375 end point at 4.25 to 4.5 cents. No buyers were in the market.

The kerosine market took on new life and quotations for cargo lots advanced. One sale was reported at 3.75 cents, but the asking price of most companies was 4 cents for the 44 gravity water white grade as the week ended.

U. S. Motor in cases was in demand from the West Indies. One sale of 500 cases at the posted price of $1.50 per case was reported.

Gas oil, 30 gravity, was quoted 0.25 cent higher to 2.5 cents by all suppliers. No sales at this price were reported. However, there was no inclination to shade that price as the week ended. The market for bunker oil in cargo lots was almost totally devoid of buying interest.

Indiana Jobber's Salesmen Meet

FORT WAYNE, IND.—The Petroleum Sales, Inc., organized here recently, held a meeting for its members and dealers Nov. 2. About 50 men attended. Frank W. Silva, president and general manager, presided.

Speakers included Earl Whatley, manager of tank car sales, Lubrite Refining Co., St. Louis; J. L. McNurney, manager in Indiana for the Vacuum Oil Co., Indianapolis; Ray Dill, advertising manager for the Lubrite at St. Louis, and L. Russell, sales representative in Fort Wayne territory for the same company. H. A. Galloway, another Lubrite representative in Fort Wayne territory, was a guest at the meeting.

G. B. Dickey to Form Company

NASHVILLE, Tenn., Oct. 30.—G. B. Dickey has resigned as vice-president of the Apex Oil Corp. of Nashville to organize a new company. Details of the new organization are to be announced later. Mr Dickey has been in the oil business in Nashville 12 years. He formerly was with the Benzol Gas Corp., one of the companies that was included in the merger that made up the Apex.

Dr. Speller Wins Steel Institute Medal

CLEVELAND, Nov. 5.—The American Iron and Steel Institute's medal for 1931 for the best paper presented at this year's meetings, was awarded to Dr. F. N. Speller, director of the department of metallurgy and research, National Tube Co., Pittsburgh. The paper was "Cooperative Research in the Iron and Steel Industry."

Dr. Speller has been active in the research and standardization work of the American Petroleum Institute, and in 1927 was chairman of the institute's committee on corrosion.

Wax Markets

Markets Unsettled

NEW YORK, Nov. 7.—The wax market at New York was unsettled during the week just ended. Scale wax was offered a bit more freely at 1.95 cents per pound. Some reports indicated that all grades of refined waxes were down 0.1 cent per pound. However, the majority of suppliers denied that such concessions would be made. Actual sales were not available at this writing.

The Spanish Monopoly was in the market for approximately 3000 tons of 125-127 A.m.p. and 128-130 A.m.p. fully refined grades. The New Orleans market was steady. Domestic shipments were reported good at unchanged prices.

On The Lazy Bench

Too Long a Wait

A "drunk" passing a subway excavation, stopped for a moment and called down to the man at the bottom of the pit: "Shay, watcha doin' down there?"

One of the men responded: "We're building a subway."

"How long is it going to take to buil' it?"

"Eight years," came the answer.

"Eight years! (hic). To 'ell with it. I'll take a taxicab."

—The Gas Line
West Penn Oil Co.

* * *

As we go to press, reports of a business depression are just beginning to seep in, but they must be absolutely baseless. Our friend, the red ink salesman, assures us that business was never better.

—Union Oil Bulletin
Union Oil Co. of California

* * *

The Truth

An old negro went to the office of the Commissioner of Registration in a Missouri town and applied for registration papers.

"What is your name?" asked the official.

"George Washington," was the reply.

"Well, George, are you the man who cut down the cherry tree?"

"No suh, I ain't de man. I ain't done no work for nigh onto a year."

—The Safe Worker
National Safety Council

* * *

Like Father Like Daughter

The daughter of a certain strict-principled old deacon had attended a dance the previous night, much against her father's wishes. When she appeared for breakfast the next morning, he greeted her with the words: "Good morning, daughter of Satan."

To which the maiden respectfully replied: "Good morning, father."

—The Gas Line
West Penn Oil Co.

* * *

Ouch!

A taxi-driver recently got the worst of a wordy bout.

An old man with a wheelbarrow wouldn't get out of the way and the driver shouted: "You ought to be wheeling a baby-buggy."

"And you ought to be in it," the old man answered.

—The Safe Worker
National Safety Council

* * *

Bragging does not bring happiness, but no man with a large fish goes home through an alley.

POINT for POINT

BURNHAM Tested PALES

"The all year oil"

Excels in *FLUIDITY* . . . Winter Grades have the lowest pour test on record. *STAMINA* . . . Used in Winter or Summer with the highest degree of satisfaction. *CARBON* . . . Lowest, and no non-lubricating waste. *COLOR* . . . Clean, distinctive, attractive. *PROFIT* . . . Unusually wide margin.

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SPECIAL *services to shippers, described on request. Address*

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Tank Cars for Lease. Domestic and Export Terminals Chicago, Tulsa, New Orleans.

Complete Seaboard Market

Export Markets for whole year given in OIL PRICE HANDBOOK. Each volume carries refinery, tank wagon, crude and export markets—complete for the whole year

Eastern Domestic Market

(Prices for tank car lots, f. o. b. refinery or seaboard terminal, representing majority of sales and quotations. Prices shown below do not include inspection tax levied in Florida and South Carolina.)

	Prices Nov. 9	Prices Nov. 2	Prices Oct. 26
U. S. MOTOR GASOLINE, Below 65 Octane Number			
New York harbor	5.50	5.25	5.25
Boston	6.00	5.625– 5.75	5.625– 5.75
Providence	6.00	5.625– 5.75	5.625– 5.75
Philadelphia District	5.50	5.25	5.25
Baltimore District	5.50	5.25	5.25
U. S. MOTOR GASOLINE, 65 Octane Number and Above			
New York harbor	5.75 – 6.00	5.50	5.50
Portland district	6.50	6.00	6.00
Boston district	6.25	5.75	5.75
Providence district	6.25	5.75	5.75
Philadelphia district	5.75 – 6.00	5.50	5.50
Baltimore district	5.75 – 6.00	5.50	5.50
Norfolk district	6.00	5.50	5.50
Charleston district	6.00	5.50	5.50
Savannah district	6.00	5.50	5.50
Jacksonville district	6.00	5.50	5.50
‡DOMESTIC AVIATION GASOLINE			
New York harbor	9.50 –12.00	9.50 –12.00	9.50 –12.00
Philadelphia	9.50 –12.00	9.50 –12.00	9.50 –12.00
Baltimore	11.00 –12.00	11.00 –12.00	11.00 –12.00
Boston	11.50 –13.00	11.50 –13.00	11.50 –13.00
WATER WHITE KEROSINE			
New York harbor	5.50	5.00	5.00
Philadelphia district	5.50	5.00	5.00
Baltimore district	5.00 – 5.50	4.875– 5.00	4.875– 5.00
GAS OIL: 28-34 Gravity			
New York harbor	3.50	3.50	3.50
Boston district	3.75	3.75	3.75
FURNACE OIL: 36-40 Gravity			
New York harbor	4.50	4.50	4.50
Boston district	4.50	4.50	4.50
GRADE C BUNKER OIL (Lighterage 5c per bbl. additional)			
New York harbor	$0.60	$0.60	$0.60
Boston district	$0.60	$0.60	$0.60
DIESEL OIL			
New York harbor	$1.30	$1.30	$1.30

‡Prices are based on U. S. Gov't. specifications or better. Present Gov't. specifications require distillation range of 5% recovery at not more than 167°F. and not less than 122°F.; 50% recovery at 221°; 90% at 311°; 96% at 347° end point 374°F. Gasoline of fighting grade specifications in some instances sells at a premium over domestic aviation grade. Prices represent majority of quotations.

New York Export Market

(Lubricating oils are per gal. in bbls. F.a.s. New York)

	Nov. 9	Nov. 2	Oct. 26
CYLINDER OILS (Pennsylvania Products)			
Bright stock, No. 8 color	29.50 –31.00	31.00 –32.00	33.00 –34.00
Bright stock, No. 6½ color diluted	29.00 –30.00	30.00 –31.00	32.00 –33.00
600 D filtered	28.00 –29.00	28.00 –29.00	28.00 –29.00
600 Warren E filtered	23.00 –24.00	23.00 –24.00	24.00 –25.00
600 stm. refd. unfiltered	20.00 –21.00	20.00 –21.00	21.00 –23.00
650 stm. refd. unfiltered	22.00 –23.00	22.00 –23.00	23.00 –24.00
600 flash steam refined	24.00 –25.00	25.00 –26.00	25.50 –26.50
630 flash, steam refined	28.00 –29.00	28.00 –29.00	29.00 –30.00
RED PARAFFIN OILS (Vis. 100°)			
300 vis. No. 6½ color	15.00 –17.00	15.00 –17.00	15.00 –17.00
250 vis. No. 6 color	15.00 –16.00	15.00 –16.00	15.00 –16.00
200 vis. No. 6 color	13.00 –14.00	13.00 –14.00	13.00 –14.00
PALE PARAFFIN OILS (Vis. 100°)			
230 vis. No. 3¾ color	16.50 –17.00	16.50 –17.00	16.50 –17.00
180 vis. No. 3¼ color	15.00 –16.00	15.00 –16.00	15.00 –16.00
100 vis. No. 2¼ color	10.50 –11.50	10.50 –11.50	10.50 –11.50

Wax Market

(Prices in cents per pound, f. a. s. carload lots. Tests made by A. S. T. M. method with melting points converted into A. M. P. by adding 3° F.)

NEW YORK	Nov. 9	Nov. 2	Oct. 26
124-126 Yellow crude scale	1.90 – 1.95	1.90 – 1.95	1.90 – 1.95
122-124 White crude scale	1.95 – 2.00	1.95 – 2.00	1.95 – 2.00
124-126 White crude scale	1.95 – 2.00	1.95 – 2.00	1.95 – 2.00
123-125 Fully refined	2.875– 3.00	2.875– 3.00	2.875– 3.00
125-127 Fully refined	2.90 – 3.00	2.90 – 3.00	2.90 – 3.00
128-130 Fully refined	3.00 – 3.125	3.00 – 3.125	3.00 – 3.125
130-132 Fully refined	3.25 – 3.50	3.25 – 3.50	3.25 – 3.50
133-135 Fully refined	4.125– 4.25	4.125– 4.25	4.125– 4.25
135-137 Fully refined	4.375– 4.50	4.375– 4.50	4.375– 4.50
NEW ORLEANS			
124-126 Yellow crude scale	1.90 – 1.95	1.90 – 1.95	1.90 – 1.95
122-124 White crude scale	1.95 – 2.00	1.95 – 2.00	1.95 – 2.00
124-126 White crude scale	1.95 – 2.00	1.95 – 2.00	1.95 – 2.00
123-125 Fully refined	2.875– 3.00	2.875– 3.00	2.875– 3.00
125-127 Fully refined	2.90 – 3.00	2.90 – 3.00	2.90 – 3.00
128-130 Fully refined	3.00 – 3.125	3.00 – 3.125	3.00 – 3.125
130-132 Fully refined	3.25 – 3.50	3.25 – 3.50	3.25 – 3.50
133-135 Fully refined	4.125– 4.25	4.125– 4.25	4.125– 4.25

Gulf Coast Bulk Market

(Prices are f. o. b. Gulf oil terminals representing sellers' opinions covering bulk shipments of 20,000 barrels or more, for export and / or coastwise shipment unless otherwise noted.)

GASOLINE	Prices Nov. 9	Prices Nov. 2	Prices Oct. 26
U. S. MOTOR GASOLINE (Domestic shipment)			
Below 65 octane number	4.25 – 4.50	4.125– 4.25	.....
Above 65 octane number	4.375– 4.75	4.25 – 4.50	.....
Export Shipment			
U.S. Motor gasoline	4.125	3.875	.....
60-62, 400 e.p. gasoline	4.25	4.00	3.875– 4.125
61-63, 390 e.p. gasoline	4.375	4.125	4.00 – 4.25
64-66, 375 e.p. gasoline	4.50	4.25	4.25 – 4.50
U. S. Motor, (cases cargoes)	$1.50	$1.50	$1.50
64-66, cases (cargoes)	$1.60	$1.60	$1.60
KEROSINE			
44 water white	4.00 – 4.25	3.375– 3.50	3.50
41-43 prime white	3.75 – 4.00	3.125– 3.25	3.25
Water white, cases (cargoes)	$1.40	$1.40	$1.40
Prime white, cases (cargoes)	$1.30	$1.30	$1.30
GAS & BUNKER OILS			
*26-30 translucent gas oil	2.25 – 2.50	2.125– 2.375	2.125– 2.375
*30 plus translucent gas oil	2.50 – 2.75	2.25 – 2.50	2.25 – 2.50
Grade C bunker oil, for ships' bunkers, per bbl.	$0.45	$0.45	$0.45
Grade C bunker oil, per bbl. in cargoes	$0.40 –$0.45	$0.38 –$0.43	$0.38 –$0.43

*Less than ½ of 1% sulphur.

MEXICAN CRUDE AND BUNKER OILS (f. o. b. Steamer, Tampico)			
Heavy Panuco crude taxes to be paid, per bbl.	$0.45	$0.45	$0.45
Grade C bunker oil for bunkering, taxes paid, per bbl.	$0.55	$0.55	$0.55

SOUTH TEXAS LUBRICATING OILS (Viscosity at 100°F. cold test 0 Tanker, f. o. b. Gulf oil terminals.)			
100 vis. No. 2 unfiltered pale	4.375– 4.50	4.375– 4.50	4.375– 4.50
200 vis. No. 3 unfiltered pale	6.00 – 6.50	6.00 – 6.50	6.00 – 6.50
300 vis. No. 3 unfiltered pale	7.625– 8.00	7.625– 8.00	7.625– 8.00
500 vis. No. 3½ unfiltered pale	8.25 – 8.75	8.25 – 8.75	8.25 – 8.75
750 vis. No. 4 unfiltered pale	9.25 – 9.75	9.25 – 9.75	9.25 – 9.75
1200 vis. No. 4 unfiltered pale	12.00 –12.50	12.00 –12.50	12.00 –12.50
200 vis. No. 5-6 red oil	5.25 – 5.75	5.25 – 5.75	5.25 – 5.75
300 vis. No. 5-6 red oil	6.25 – 6.75	6.25 – 6.75	6.25 – 6.75
500 vis. No. 5-6 red oil	7.25 – 7.75	7.25 – 7.75	7.25 – 7.75
750 vis. No. 5-6 red oil	8.25 – 8.75	8.25 – 8.75	8.25 – 8.75
1200 vis. No. 5-6 red oil	13.25 –13.50	13.25 –13.50	13.25 –13.50

Pacific Export Market

(Quotations are at seaboard, Los Angeles, in cargo lots, cents per gallon, except where otherwise noted.)

	Nov. 9	Nov. 2	Oct. 26
Gasoline, U. S. Motor, 53-55 Gravity	3.50 – 4.25	3.50 – 4.25	3.50 – 4.25
Gasoline, U. S. Motor-blends and special cuts	3.75 – 4.50	3.75 – 4.50	4.50 – 5.25
Gasoline, 400 e.p. blend	4.00 – 4.75	4.00 – 4.75	4.75 – 5.50
Gas oil, 30-34 per bbl.	$0.78 –$0.90	$0.78 –$0.90	$0.78 –$0.90
Diesel Oil, 27 plus, per bbl.	$0.80 –$0.90	$0.80 –$0.90	$0.78 –$0.90
Bunker oil, 14-18 per bbl.	$0.55 –$0.70	$0.55 –$0.70	$0.55 –$0.70
Fuel oil, 14-18 per bbl.	$0.55 –$0.70	$0.55 –$0.70	$0.55 –$0.70
Kerosine, 38-40 w.w., 125-150 flash, per gal.	4.25 – 4.75	4.25 – 4.75	4.25 – 4.75
Cased Goods			
Gasoline, U. S. Motor	$1.35 –$1.45	$1.35 –$1.45	$1.45 –$1.55
Gasoline, 400 e.p. blend	$1.50 –$1.60	$1.50 –$1.60	$1.55 –$1.65
Kerosine, 38-40 w.w., 125-150 flash	$1.25 –$1.35	$1.25 –$1.35	$1.40 –$1.45
Kerosine, prime white	$1.05 –$1.15	$1.05 –$1.15	.....

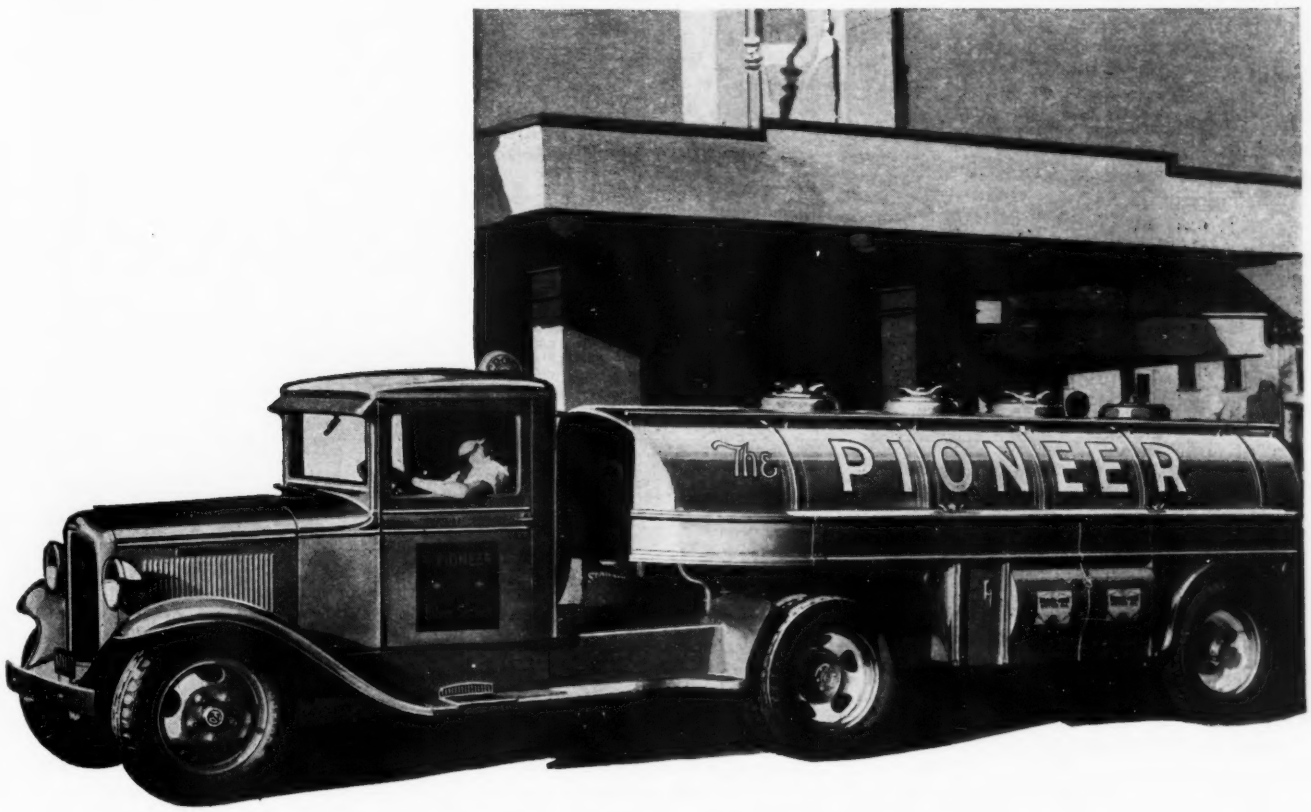
Tanker Rates

(Approximate tanker freight rates to Continental ports, in shillings per ton of 2240 pounds, British sterling; to American ports, cents per barrel.)

	Nov. 9 Crude &/or Fuel	Nov. 9 Refined Oil &/or Spirits
Calif. to U. K. or Continental ports*	†15	††15
Gulf to U. K. or Continental ports*	9	9
North Atlantic to U. K. or Continental ports*	7/6	7/6
Calif. to North Atlantic ports (not E. of N. Y.)	$0.45-$0.47	$0.45-$0.47
Gulf to North Atlantic ports (not E. of N. Y.)**	14-15	15

*Continental ports in the range between Bordeaux and Hamburg, both inclusive. **Venezuela loading same rate, for Tampico 2c to 3c per bbl. additional. †Last paid 12/6; owners ask 15. ††Last paid 11/6; owners ask 15.

More Profitable Oil Haulage . . . with the SPEED WAGON



THE new SPEED WAGON is engineered for heavy hauling assignments. Engine, transmission, frame, axles, springs, brakes, wheels have the true proportions of the sturdy, long-life commercial vehicle that it is. And the new Reo SPEED WAGON with bodies for every phase of petroleum haulage, factory-fitted to the chassis, speeds up deliveries, cuts costs, insures maximum hauling profit.

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LANSING - - - TORONTO

THE NEW 1/2 TON REO SPEED WAGON

Reo Trucks and Speed Wagons range from 1½-ton to 4 tons. Prices $625 to $2800, chassis f. o. b. Lansing

$625

Four-Cylinder $625, Six-Cylinder $725. *Chassis f. o. b. Lansing, Michigan.* Dual Wheels $22 Extra

Tank Wagon, Service Station Markets for Gasoline and Kerosine

(OIL PRICE HANDBOOK has t.w. and s.s. markets for a whole year, arranged for quick reference)

These Prices in Effect November 9, 1931, as Posted by Principal Marketing Companies

Latest Changes in Tank Wagon Prices

Gasoline

S. O. New Jersey—S.s. only cut 2c, Richmond, to 14.9c, including 5c tax, **Nov. 6.**

S. O. New York—T.w. and s.s. cut 1.1c, New Haven, to 13.5c and 14.5c respectively, including 2c tax, **Oct. 17.**

Atlantic Refining—T.w. and s.s. cut 2.4c, Hagerstown, to 13.5c and 14.5c respectively including 4c tax, **Oct. 31.** T.w. only up 1c, to 14.5c, **Nov. 5.**

T.w. only cut 2c, Brunswick, to 15c, including 6c tax, **Nov. 5.**

S.s. only up 1c, Philadelphia, to 14c, including 3c tax, **Nov. 9.**

S. O. Ohio—S.s. only up 1c thru Franklin county, to 17c, including 4c tax, **Nov. 7.**

X-70 t.w. and s.s. up 1c thru Ohio to 17c and 18c generally, including 4c state tax, **Nov. 9.**

Hi-So Green t.w. and s.s. up 1c thru Ohio, **Nov. 9.**

S. O. Kentucky—Crown Gasoline: T.w. and s.s. cut ½c, Atlanta, both to 17.5c, including 6c tax, **Oct. 27.**

T.w. and s.s. up 1c, Montgomery, to cover Montgomery county tax of 1c, effective Nov. 1, both Crown Gasoline and Kyso Green.

T.w. and s.s. up ½c, Jackson and Vicksburg, to cover ½c tax increase in Mississippi to 5.5c, **Nov. 1,** both Crown Gasoline and Kyso Green.

T.w. up 1c, s.s. up 3c, Jacksonville, both to 19c, including 7c tax, **Oct. 28.**

T.w. and s.s. up 2c, Miami, to 19c and 20c respectively, including 7c tax, **Oct. 28.**

T.w. and s.s. up 2c, Tampa, both to 19c, including 7c tax, **Oct. 28.**

T.w. only cut 1c, Paducah, to 17c, including 5c tax, **Nov. 1.**

Kyso Green: T.w. and s.s. cut ½c, Atlanta, both to 16c, including 6c tax, **Oct. 27.**

S. O. Indiana—Red Crown: T.w. and s.s. up 1c, thru territory, **Nov. 6.** Exceptions: T.w. cut 1c, s.s. up 1c, St. Joseph, both to 10.4c, including 2c tax. Detroit unchanged.

Stanolind Blue: T.w. and s.s. up 1c thru territory, **Nov. 6.** Exception: Detroit unchanged.

Correction: Thru typographical error, t.w. price without tax at Detroit has been published at 10.3c, since the Oct. 14 issue. Correct t.w. price without tax was 9.5c, effective **Oct. 6.**

S. O. Nebraska—T.w. and s.s. up 1c generally thru territory, **Nov. 7.** Exception: Omaha t.w. and s.s. cut 35/100c to 14.9c and 15.9c respectively, including 4c tax.

S. O. Louisiana—Standard Gasoline: T.w. and s.s. up ½ to 1c, thru territory, Nov. 5. Prices in Tennessee up 1c, and in Louisiana, at points south of Alexandria and in Alexandria, up 1c; up ½c, thru Arkansas, and in Louisiana north of Alexandria.

T.w. and s.s. cut 1c, New Orleans, both to 14.5c, including 6c tax, **Nov. 7.**

T.w. and s.s. cut ½c, Lake Charles, both to 14.5c, including 6c tax, **Oct. 30.**

T.w. and s.s. cut 1.5c, Alexandria, both to 15.5c, including 6c tax, **Nov. 7.**

T.w. and s.s. cut 1.5c, Lake Charles, both to 14c, including 6c tax, **Nov. 7.**

Blue-Gas: S.s. cut ½c, Lake Charles, to 12.5c, including 6c tax, **Oct. 31.**

S.s. cut ½c, Alexandria, to 14c, including 6c tax, **Oct. 30.**

Magnolia Petroleum—T.w. and s.s. up 1c, thru Oklahoma, **Nov. 4.**

Continental Oil—T.w. and s.s. up 1c generally thru Montana, Wyoming, Colorado and New Mexico, **Nov. 7.** Exceptions: Denver and Pueblo unchanged.

Aviation Gasoline

S. O. Indiana—T.w. up 1c thru territory, **Nov. 6.**

Continental Oil—T.w. up 1c, Cheyenne, to 19c, including 4c tax; Helena, to 24c, including 5c tax; Albuquerque, to 22c, including 5c tax, **Nov. 7.**

Kerosine

S. O. New York—Kerosine t.w. cut 2c, Borough of Richmond, and ½c at Syracuse, both to 9c, **Oct. 28.**

Kerosine t.w. cut 2c, Burlington, to 9c, **Nov. 9.**

S. O. Nebraska—Kerosine cut 3.25c, McCook, to 7.5c, **Nov. 7.**

Kerosine cut 1.25c, Scottsbluff, to 9c, **Nov. 7.**

S. O. California — Correction: T.w. price of kerosine at Seattle and Tacoma has been erroneously published at 20.5c since the June 24 issue. Correct price has been 16.5c, unchanged since the first of the year.

S.O. NEW JERSEY TERRITORY

	Gasoline T.W.	Tax	Total T.W.	S.S.	Oil T.W.
Atlantic City, N. J.	11.7	3	14.7	15.7	11.5
Newark, N. J.	10.7	3	13.7	14.7	10.5
Annapolis, Md.	11.2	4	15.2	16.2	11
Baltimore, Md.	10.4	4	14.4	15.4	8.5
Cumberland, Md.	12.2	4	16.2	17.2	12
Washington, D. C.	10.9	2	12.9	13.9	10.7
Danville, Va.	12	5	17	18	11.8
Norfolk, Va.	10.5	5	15.5	16.5	10.3
Petersburg, Va.	11.5	5	16.5	17.5	11.3
Richmond, Va.	10.9	5	15.9	14.9	10.7
Roanoke, Va.	12.2	5	17.2	18.2	12
Charleston, W. Va.	11.7	4	15.7	16.7	11.5
Keyser, W. Va.	12.3	4	16.3	17.3	12.1
Parkersburg, W. Va.	10.4	4	14.4	15.4	10.2
Wheeling, W. Va.	11.6	4	15.6	16.6	11.4
Charlotte, N. C.	12.5	6	18.5	19.5	10.7
Hickory, N. C.	12.8	6	18.8	19.8	12.6
Mt. Airy, N. C.	12.7	6	18.7	19.7	12.5
Raleigh, N. C.	12.4	6	18.4	19.4	12.2
Salisbury, N. C.	12.7	6	18.7	19.7	12.5
Charleston, S. C.	10.5	6	16.5	17.5	10.3
Columbia, S. C.	12.4	6	18.4	19.4	12.2
Spartanburg, S. C.	12.7	6	18.7	19.7	12.5

Discounts: gasoline, 2c per gallon discount off retail t.w. price to dealers thru S. O. New Jersey territory, except Maryland, New Jersey and Washington, D. C. where discount is 3c.

S. O. NEW YORK

Greater New York City: Boroughs of Manhattan, Bronx, Queens & Kings	12.3	2	14.3	16.3	9
Borough of Richmond	12.7	2	14.7	16.7	9
Albany, N. Y.	11.6	2	13.6	14.6	10.5
Buffalo, N. Y.	11	2	13	13	10
Rochester, N. Y.	12	2	14	14	10
Syracuse, N. Y.	10.8	2	12.8	13.8	9
Boston, Mass.	10.5	3	13.5	14.5	10
Augusta, Me.	12.8	4	16.8	17.8	10.5
Manchester, N. H.	10	4	14	15	10
Burlington, Vt.	13.3	4	17.3	17.3	9
New Haven, Conn.	11.5	2	13.5	14.5	9
Providence, R. I.	9.5	2	11.5	12.5	10

Discounts: on gasoline 2c per gal. off posted t.w. price to dealers, thru territory, except 3c to dealers in New York City.

ATLANTIC REFINING

Pittsburgh, Pa.	11	3	14	15	11
Philadelphia, Pa.	10	3	13	14	11
Allentown, Pa.	10	3	13	14	11
Erie, Pa.	11	3	14	15	11
Scranton, Pa.	10	3	13	14	11
Altoona, Pa.	11	3	14	15	11
Dover, Del.	11	3	14	15	11
Wilmington, Del.	11	3	14	15	11
Boston, Mass.	10.5	3	13.5	14.5	10
Springfield, Mass.	10	3	13	14	10
Worcester, Mass.	11.3	3	14.3	15.3	10
Fall River, Mass.	9	3	12	13	10
Providence, R. I.	9.5	2	11.5	12.5	10
Hartford, Conn.	11	2	13	14	10
New Haven, Conn.	12.6	2	14.6	15.6	10
Atlantic City, N. J.	11.7	3	14.7	15.7	11.5
Camden, N. J.	10.8	3	13.8	14.8	10.6
Trenton, N. J.	11.2	3	14.2	15.2	11
Annapolis, Md.	11.2	4	15.2	16.2	11
Baltimore, Md.	10.4	4	14.4	15.4	8.5
Hagerstown, Md.	10.5	4	14.5	14.5	11.7
Richmond, Va.	10.9	5	15.9	16.9	10.7
Wilmington, N. C.	10.6	6	16.6	17.6	10.4
Brunswick, Ga.	9	6	15	17	*13
Jacksonville, Fla.	12	7	19	19	12

Discounts: on gasoline to dealers: "split dealers", 2c off posted t.w. price; to 100% dealers, 2.5c off t.w.; to authorized dealers (under lease 1c per gal.), 2.5c off posted s.s. price.

Commercial accounts, under contract for one year, are sold at a discount off the posted prices, with due consideration to competition.

***Georgia kerosine prices include 1c state tax.**

S. O. OHIO

Sohio X-70

Ohio statewide	13	4	17	18	13
Ashtabula, Clark, Defiance, Fulton, Greene, Henry, Lucas, Marion, Miami, Preble, Summit and Williams counties	13	4	17	17	13

Above prices include these inspection fees on both gasoline and kerosine, per gallon: Alabama, 1/40c on gasoline, 1/2c kerosine; Arkansas, 1/20c on both; Florida, 1/8c on both; Illinois, 3/100c on both; Indiana, 2/25c to 1/2c on both; Kansas, 3/50c on both; Louisiana, 1/32c on gasoline; Minnesota, 3/50c on both; Missouri, 1/50c to 1/2c on both; Nebraska 3/100c on both; North Carolina, 1/4c on both; North Dakota, 1/20c on both; Oklahoma, 4/25c on both; South Carolina 1/8c on both; South Dakota, 1/10c on both; Tennessee, 2/5c on gasoline and 1/2c to 4/5c on kerosine; Wisconsin, 1/25c on both.

Kerosine inspection fees only, per gallon: Iowa 7/100c; Michigan, 1/5c to 4/5c per gal.

Tank Wagon, Service Station Markets for Gasoline and Kerosine

These Prices in Effect November 9, 1931, as Posted by Principal Marketing Companies

S. O. OHIO (*Continued*)

	Gasoline T.W.	Tax	Total T.W.	S.S.	Oil T.W.
Butler, Montgomery and Pickaway counties	12	4	16	16	13
***Hi-So Green (Third Grade)**					
Ohio statewide	..	..	..	16	13

(Not sold to consumers)

***Sells generally 2c under s.s. price of Sohio X-70. To resellers, discount is 1½c below Hi-So Green s.s. price.**

Discounts: on Sohio X-70 gasoline, to dealers and commercial consumers generally thru Ohio, 2c per gal. off t.w. price except in counties where prices are below statewide schedule discount is generally 3c.

S. O. KENTUCKY

Lexington, Ky.	11	5	16	17	12
Louisville, Ky.	10	5	15	16	10
Paducah, Ky.	12	5	17	18	11
Covington, Ky.	12	5	17	18	11
Jackson, Miss.	10.5	5.5	16	16	11.5
Vicksburg, Miss.	9.5	5.5	15	15	11.5
Birmingham, Ala.	9.5	‡‡6	15.5	15.5	13
Mobile, Ala.	9	‡8.5	17.5	17.5	10
Montgomery, Ala.	13	*7	20	20	13.5
Macon, Ga.	13	6	19	19	†12
Atlanta, Ga.	11.5	6	17.5	17.5	*†12.5
Augusta, Ga.	13	6	19	20	†14
Savannah, Ga.	11	6	17	17	†12
Jacksonville, Fla.	12	7	19	19	12
Miami, Fla.	12	7	19	20	13
Tampa, Fla.	12	7	19	19	12
Pensacola, Fla.	12	**8	20	21	13
Kyso Green (Third Grade)					**Oil**
Lexington, Ky.	9	5	14	14	12
Louisville, Ky.	8	5	13	13	10
Paducah, Ky.	9	5	14	14	11
Jackson, Miss.	9	5.5	14.5	14.5	11.5
Vicksburg, Miss.	8	5.5	13.5	13.5	11.5
Birmingham, Ala.	8	‡‡6	14	14	13
Mobile, Ala.	7.5	‡8.5	16	16	10
Montgomery, Ala.	11.5	*7	18.5	18.5	13.5
Atlanta, Ga.	10	6	16	16	*12.5
Macon, Ga.	11.5	6	17.5	17.5	†12

Discounts: on gasoline, 2c per gal. off t.w. price to dealers thru S. O. Kentucky territory.

*Montgomery gasoline tax includes 5c state tax, 1c county tax, and 1c local privilege tax. Kerosine price includes ½c tax.

†Georgia kerosine prices include 1c state tax.

**Pensacola gasoline tax includes 7c state tax and 1c city tax.

‡Mobile gasoline tax includes 5c state tax, 1c city tax and 2.5c Mobile County tax.

‡‡Birmingham gasoline tax includes 5c state tax and 1c city tax.

*†3c discount off t.w. price of oil at Atlanta, meeting competition.

S. O. INDIANA

Standard Red Crown Gasoline

Chicago, Ill.	12	3	15	15	9
Decatur, Ill.	12.4	3	15.4	15.4	9
E. St. Louis, Ill.	11.7	3	14.7	14.7	8.2
Joliet, Ill.	12.4	3	15.4	15.4	9
Peoria, Ill.	12.4	3	15.4	15.4	9
Quincy, Ill.	12.2	3	15.2	15.2	8.8
Springfield, Ill.	12.4	3	15.4	15.4	9
Indianapolis, Ind.	12.3	4	16.3	16.3	10.1
Evansville, Ind.	12.1	4	16.1	16.1	9.9
South Bend, Ind.	12.4	4	16.4	16.4	8
Detroit, Mich.	11.5	3	14.5	14.5	10.7
Grand Rapids, Mich.	12.7	3	15.7	15.7	10.6
Saginaw, Mich.	12.9	3	15.9	15.9	10.8
Marquette, Mich.	12.9	3	15.9	15.9	10.8
Green Bay, Wisc.	12.6	4	16.6	16.6	9.4
Madison, Wisc.	12.3	4	16.3	16.3	9.1
Milwaukee, Wisc.	12.1	4	16.1	16.1	8.9
La Crosse, Wisc.	13.2	4	17.2	17.2	10
Minneapolis, Minn.	11.4	3	14.4	14.4	9.9
Duluth, Minn.	13.5	3	16.5	16.5	9.9
Mankato, Minn.	13.1	3	16.1	16.1	8
Des Moines, Ia.	12.5	3	15.5	14.4	8
Davenport, Ia.	12.5	3	15.5	13.5	9.3
Sioux City, Ia.	12.1	3	15.1	15.1	8.9
Mason City, Ia.	12.5	3	15.5	15.5	9.3
St. Louis, Mo.	*11.4	2	13.4	13.4	8.3
Kansas City, Mo.	†12.9	2	14.9	14.9	7.6
St. Joseph, Mo.	† 8.4	2	10.4	10.4	7.5
Fargo, N. D.	14.9	3	17.9	17.9	11.9
Grand Forks, N. D.	15.2	3	18.2	18.2	12.2
Minot, N. D.	14.9	3	17.9	17.9	11.9
Pierre, S. D.	13	4	17	17	10.4
Huron, S. D.	13.3	4	17.3	17.3	10.7
Wichita, Kans.	10.8	3	13.8	13.8	7.8
Bartlesville, Okla.	9	5	14	16	7

*Includes city tax of ½c.

†Includes city tax of 1c.

Stanolind Blue Gasoline

Stanolind Blue prices are 1.5c per gal. under Red Crown, except at following points:

E. St. Louis, Ill.	10.2	3	13.2	10.7	..
Peoria, Ill.	10.9	3	13.9	12	..
Quincy, Ill.	9.2	3	12.2	13.7	..
St. Joseph, Mo.	†6.9	2	8.9	8.9	..
St. Louis, Mo.	*9.9	2	11.9	11.9	..
Detroit, Mich.	9.5	3	12.5	12.5	..
Grand Rapids, Mich.	11.2	3	14.2	13.2	..
Wichita, Kans.	9.3	3	12.3	10.8	..
Minneapolis, Minn.	8.9	3	11.9	11.9	..
Evansville, Ind.	10.6	4	14.6	14	..
Davenport, Ia.	11	3	14	11.9	..
Des Moines, Ia.	11	3	14	11.9	..
Sioux City, Ia.	10.6	3	13.6	10.9	..
La Crosse, Wisc.	11.7	4	15.7	15	..

*Includes city tax of ½c.

†Includes city tax of 1c.

Discounts: Q.D.A., effective May 11, 1931, on gasoline: **To re-sellers,** thru territory, except Chicago:

Under 75,000 gals., off service station price: Ethyl, 3c, Red Crown, 2.5c, and Stanolind Blue, 1.5c per gal.; 75,000 gals. and over, off tank wagon price: Ethyl, 4c, Red Crown, 3.5c, and Stanolind Blue, 2c.

In Chicago, in any quantity, discounts are 4c per gal. on Ethyl gasoline, 3.5c on regular motor fuel grades and 2c on "third" grades, by principal marketing companies, discounts being off service station prices in quantities up to 75,000 gallons, and off t.w. price in quantities of 75,000 gallons and over.

To consumers, thru territory, except Chicago:

1,000 to 75,000 gals., off tank wagon price: Ethyl, 3c; Red Crown, 2.5c; and Stanolind Blue, 1.5c; 75,000 gals. and over, off tank wagon price, Ethyl, 4c; Red Crown, 3.5c; and Stanolind Blue, 2c.

In Chicago, in quantities over 1,000 gallons: Ethyl gasoline, 4c; regular grades 3.5c; "third" grades 2c, all discounts being off tank wagon price.

S. O. NEBRASKA

Red Crown Gasoline

Omaha, Neb.	10.9	4	14.9	15.9	9.25
McCook, Neb.	13	4	17	17	7.5
Norfolk, Neb.	12.75	4	16.75	17.75	9.75
North Platte, Neb.	13.75	4	17.75	18.75	10.5
Scottsbluff, Neb.	13	4	17	17	9

Nebraska Blue (Third Grade)					**Oil**
Omaha, Neb.	...	4	....	13.9	9.25

Discounts on gasoline to dealers, off normal service station prices) Red Crown Ethyl 3c) Red Crown 2.5c per gal.) Nebraska Blue, 1c.

S. O. LOUISIANA

Standard Gasoline

	Posted Retail T.W.	Tax	Total Posted Retail T.W.	Posted Retail S.S.	Oil T.W.
Little Rock, Ark.	11.5	6	17.5	18	11
Alexandria, La.	9.5	*6	15.5	15.5	†12
Baton Rouge, La.	11.5	5	16.5	17	†12
New Orleans, La.	8.5	*6	14.5	14.5	*10
Lake Charles, La.	8	*6	14	14	†12
Shreveport, La.	11.5	5	16.5	17	†12
Lafayette, La.	11.5	*6	17.5	18	†12
Bristol, Tenn.	13.5	6	19.5	20	14
Chattanooga, Tenn.	13.5	6	19.5	20	12
Knoxville, Tenn.	14	6	20	20.5	13.5
Memphis, Tenn.	11	6	17	17	11
Nashville, Tenn.	13	6	19	19.5	12.5

Blue-Gas (Third Grade)

	Tax	Total Posted Retail S.S.	Oil T.W.
Little Rock, Ark.	6	12	11
Alexandria, La.	*6	14	†12
Baton Rouge, La.	5	11.75	†12
New Orleans, La.	*6	12.5	*10
Lake Charles, La.	*6	12.5	†12
Shreveport, La.	5	12	†12
Chattanooga, Tenn.	6	17	12
Knoxville, Tenn.	6	17	13.5
Memphis, Tenn.	6	15	11
Nashville, Tenn.	6	14	12.5

Discounts: on gasoline and kerosine, in S. O. La. territory: To dealers and commercial consumers from the tankwagon, 2c per gal. off posted retail tank wagon price.

*Lake Charles, Alexandria, New Orleans and Lafayette gasoline tax includes 5c state tax and 1c parish tax. New Orleans kerosine price includes 1c parish tax in addition to 1c state tax.

†Kerosine price in Louisiana includes 1c state tax.

MAGNOLIA PETROLEUM

Maximum Mileage Gasoline

	T.W.	Tax	Total T.W.	S.S.	Oil T.W.
Muskogee, Okla.	8	5	13	15	8
Oklahoma City	9	5	14	16	7
Tulsa, Okla.	9	5	14	16	8
Fort Smith, Ark.	10.5	†5	**15.5	16.5	**11
Little Rock, Ark.	10.5	6	**16.5	17.5	**11
Texarkana, Ark.*	8	*4	12	14	8
Dallas, Tex.	9	4	13	14	8
El Paso, Tex.	10	4	14	16	10
Fort Worth, Tex.	9	4	13	14	7
Houston, Tex.	8	4	12	14	8
San Antonio, Tex.	8	4	12	14	7
Third Grade Gasoline					**Oil**
Muskogee, Okla.	7	5	12	12	8
Oklahoma City	8	5	13	13	7
Tulsa, Okla.	8	5	13	13	8
Fort Smith, Ark.	8	5	13	13	**11
Little Rock, Ark.	6	6	12	12	**11

***Within city of Texarkana, the state tax on gasoline is 4c per gal. conforming with the Texas state tax. In this district outside of the city the 6c Arkansas tax applies.**

†Fort Smith gasoline prices include Oklahoma tax of 5c; outside Fort Smith, Arkansas tax of 6c applies.

****Less 2c to dealers.**

CONTINENTAL OIL

Denver, Colo.	10	4	14	17	12.5
Pueblo, Colo.	8	4	12	15	12
Grand Junc., Colo.	14	4	18	21	14.5
Casper, Wyo.	11	4	15	18	10
Cheyenne, Wyo.	11	4	*15	15	11.5
Butte, Mont.	13	5	18	21	16
Helena, Mont.	16	5	21	24	16
Salt Lake City, Utah	13.5	4	17.5	20.5	16
Boise, Ida.	15.5	5	20.5	23.5	18
Twin Falls, Ida.	†15.5	5	†20.5	21	18
Albuquerque, N. M.	13	5	18	21	14

†2.5 per gal. off t.w. price at Twin Falls to dealers.

*3c per gal. off t.w. price at Cheyenne to dealers.

S. O. CALIFORNIA

	Tax	Tank Truck (Resale)	*Retail Prices	Oil
San Francisco, Cal.	3	13.5	16.5	15.5
Los Angeles, Cal.	3	13	16	15.5
Fresno, Cal.	3	13.5	16.5	17
Phoenix, Ariz.	5	14.5	16	20
Reno, Nev.	4	17.5	20.5	19
Portland, Ore.	4	15	18	16.5
Seattle, Wash.	5	16	19	16.5
Spokane, Wash.	5	19.5	22.5	20.5
Tacoma, Wash.	5	16	19	16.5

Discounts: none on gasoline. Tank truck prices are those to resale trade; wholesale prices are generally 6c above tank truck prices, except at Phoenix, 1c.

*Retail prices are those of Standard Stations, Inc., marketing subsidiary of the Standard Oil Co. of California.

CANADA

Per Imperial Gallon, which is 1.2 American Gallons)

ONTARIO

Regular Gasoline

	T.W.	Tax	Total T.W.	S.S.	Oil T.W.
Toronto	17.5	5	22.5	26	18.5
Ottawa	18.5	5	23.5	27	19.5
North Bay	21.5	5	26.5	32	22.5
Fort William	19.5	5	24.5	28	17.5
Border Cities, including Windsor	17.5	5	22.5	26	16.5
Third Grade Gasoline					
Toronto	....	5	....	23.5	18.5
Regular Gasoline					
MANITOBA					
Winnipeg	19.5	5	24.5	28	13.5
SASKATCHEWAN					
Regina	23.5	5	28.5	32.5	17
ALBERTA					
Edmonton	24.5	5	29.5	33	18
Calgary	21	5	26	29.5	14.5
BRITISH COLUMBIA					
Vancouver	21.5	5	26.5	27.5	22
QUEBEC					
Montreal	17.5	5	22.5	26	19.5
Quebec City	20.5	5	25.5	29	21.5
Three Rivers	20.5	5	25.5	29	21.5
NEW BRUNSWICK					
St. John	20	5	25	29	22
Moncton	20	5	25	29	22
NOVA SCOTIA					
Halifax	20	5	25	29	22
PRINCE EDWARD ISLAND					
Charlottetown	20	5	25	29	22

(*Continued on Page* 108)

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SALES OFFICES

New York Los Angeles Buffalo Chicago Pittsburgh Tulsa Kansas City Philadelphia Boston

Crude Oil Prices (in Effect Nov. 9, 1931)

Crude prices for the whole year in OIL PRICE HANDBOOK published annually

EASTERN FIELDS

Posted by Joseph Seep Purchasing Agency

(All Penna. Grade Crude except Corning. Effective Nov. 1, 1931)

Bradford—Alleghany district (Penna. and New York, posted by Tide Water Pipe Co., Ltd.).....$2.00
Penna. Grade Oil in National Transit Lines..*1.95
(Effective Sept. 12, 1931)
Penna. Grade Oil in Southwest Penna. Pipe Lines..... 1.70
Penna. Grade Oil in Eureka Pipe Lines (West Virginia)..... 1.60
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O.)..... 1.50
Corning Grade in Buckeye Pipe Lines (Ohio).. 0.85
(Effective Nov. 7, 1931)
Ragland in Cumberland Pipe Lines (Kentucky) (Effective Jan. 9, 1929).....$0.60

*Oil run prior to July 1, 1929 is 5c less per bbl.

Posted by Other Companies

Ashland Refining Co.:
Somerset in Ashland lines (Kentucky) (Effective Nov. 4, 1931).....$0.80
Stoll Oil Refining Co.:
Stoll Pipe Line Oil (Kentucky) (Effective Nov. 9, 1931).....$0.75

MICHIGAN

(Posted by Pure Oil Co.)

Midland, Midland County (Aug. 23, 1931)..$0.73

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.

Effective Nov. 3, 1931

Wooster	$1.15	Princeton	$0.95
Lima	1.00	Illinois	0.95
Indiana	0.60	West Kentucky	0.90

CANADIAN CRUDE

Posted by Imperial Oil Refineries, Ltd.

Effective Nov. 3, 1931

Petrolia, Ont.....$1.90
Oil Springs, Ont.....$1.97

Effective Aug. 25, 1931

Turner Valley, Alta.:

45-49.9	$2.08	50 and above	$2.65

OKLAHOMA, KANSAS and NORTH TEXAS

Prices of Stanolind Crude Oil Purchasing Co. (In Oklahoma, Kansas, North and North Central Texas)

(Effective Nov. 2, 1931)

Below 29	$0.61	35-35.9	$0.75
29-29.9	0.63	36-36.9	0.77
30-30.9	0.65	37-37.9	0.79
31-31.9	0.67	38-38.9	0.81
32-32.9	0.69	39-39.9	0.83
33-33.9	0.71	40 and above	0.85
34-34.9	0.73		

Effective Nov. 2, 1931, above prices were met by these companies: Humble, The Texas Co., Continental Oil, Barnsdall and Phillips Petroleum; on Nov. 3 by Carter Oil, Sinclair, Pure Oil and Gulf.

Humble's prices affect Ranger, North Texas, Mexia, Powell, Boggy Creek, Wortham, Currie and Moran, Tex.

East Texas

Discontinued by Humble, June 3.

Magnolia posts $0.83 effective Nov. 2, 1931.

Magnolia Petroleum Co.
(In Oklahoma and Texas)

Effective Nov. 2, 1931

Oklahoma:

Cushing, Morrison, Oklahoma City, Seminole Wewoka and Yale.....$0.83
Cement, Duncan and Walters..... 0.75
Healdton..... 0.52
Hewitt and Graham..... 0.67

Texas:

North and North Central:
Archer, Burkburnett, Comanche, Electra, Henrietta, Olden and Stephens.....$0.83
East Texas.....$0.83

East Central Texas:

Thrall (Effective July 24, 1931).....$0.40

Central Texas:

Mexia, Wortham, Corsicana Light, Panola county and Lytton Springs.....$0.79

Panhandle:

Gray county.....$0.73
Carson-Hutchinson counties.....$0.66

West Texas:

Winkler, Crane, Upton, Howard, Glasscock, and Mitchell counties.....$0.50

South Texas:

Mirando.....$0.75
Darst Creek..... 0.60
Corsicana heavy and Luling..... 0.49

Louisiana-Arkansas

Effective Nov. 4, 1931

North Louisiana:

Bull Bayou.....$0.83
Cotton Valley..... 0.61
Haynesville..... 0.65
Pine Island..... 0.73

Arkansas:

El Dorado and Rainbow.....$0.63
El Dorado, East Field (Calion).....$0.55
Smackover.....$0.55

PANHANDLE TEXAS

Humble Oil & Refining Co.

Effective Nov. 2, 1931

Hutchinson-Carson Counties		Gray County	
Below 35	$0.56		$0.61
35-35.9	.58		.63
36-36.9	.60		.65
37-37.9	.62		.67
38-38.9	.64		.69
39-39.9	.66		.71
40 and above	.68		.73

Above prices met by The Texas Co. on Nov. 2 in Hutchinson, Carson and Gray counties.

WEST TEXAS and NEW MEXICO

Humble Oil & Refining Co.

Effective Nov. 2, 1931

Pecos, Winkler, Crane, Upton, Crockett, Ector, Howard and Glasscock Counties, Tex., and Lea county, N. Mex.....$0.50

Nov. 2, 1931, The Texas Co. same prices in Crane, Upton, Winkler and Lea counties as Humble.

SOUTH and SOUTHWEST TEXAS

(Posted by Humble Oil & Refining Co.)

Effective Nov. 2, 1931

Mirando.....$0.75
Salt Flat..... 0.60
Darst Creek..... 0.60
Pettus, Bee County..... 0.85

(Posted by The Texas Co.)

Effective Nov. 2, 1931

Markham.....$0.67

NORTH LOUISIANA—ARKANSAS FIELDS

Prices of Standard Oil Co. of Louisiana

Caddo, Homer, Haynesville, Bull Bayou, El Dorado Crichton, De Soto, Sabine, Sarepta and Carterville.

Effective Nov. 4, 1931

Below 25	$0.53	33-33.9	.71
25-25.9	.55	34-34.9	.73
26-26.9	.57	35-35.9	.75
27-27.9	.59	36-36.9	.77
28-28.9	.61	37-37.9	.79
29-29.9	.63	38-38.9	.81
30-30.9	.65	39-39.9	.83
31-31.9	.67	40 and above	.85
32-32.9	.69		

Smackover.....$0.55
*Urania, La..... 0.55
†Stephens, Ark.:
Below 29.....$0.51
29 and above..... 0.54

*Urania posted by Louisiana Oil Refining Corp.

†Stephens posted by Atlantic Oil Producing Co. and Louisiana Oil Refg. Corp.

*GULF COASTAL

Posted by Humble Oil & Refining Co

Effective Nov. 2, 1931

Below 25	$0.70	33-33.9	$0.79
25-25.9	0.71	34-34.9	.80
26-26.9	.72	35-35.9	.81
27-27.9	.73	36-36.9	.82
28-28.9	.74	37-37.9	.83
29-29.9	.75	38-38.9	.84
30-30.9	.76	39-39.9	.85
31-31.9	.77	40 and above	.86
32-32.9	.78		

Refugio heavy.....$0.75

***Includes these fields: Barbers Hill, Goose Creek, Hull, Humble, Liberty, Moss Bluff, Mykawa, Orange, Pierce Junction, Raccoon Bend, Refugio light, Sour Lake, Spindletop, Sugarland and West Columbia.**

The Texas Co. met above Gulf Coastal schedule Nov. 2.

Crude Price Changes

ASHLAND, Ky.—Nov. 4 Ashland Refining Co. advanced Somerset, Ky. crude in Ashland lines (formerly Cumberland lines), 15 cents, to new price of $0.80 per barrel.

TORONTO—Nov. 3 Imperial Oil Refineries, Ltd. advanced Canadian crude 10 cents, making new prices of Petrolia, Ont. $1.90 and Oil Springs, Ont., $1.97 per barrel.

NEW ORLEANS—Nov. 4 Standard Oil Co. of Louisiana advanced all North Louisiana and Arkansas crudes in amounts ranging from 7 to 15 cents, posting below 25 gravity as its minimum grade at $0.53. It had formerly posted below 29 as its minimum grade. A 2 cent differential applies from 25-25.9 gravity upward, to top grade of 40 and above, which is $0.85 per barrel. This posting conforms to the Stanolind schedule on Mid-Continent crude, except for the five lower grades.

The advance affects Caddo, Homer, Haynesville, Bull Bayou, Sabine, Crichton, De Soto, El Dorado, Sarepta, and Carterville.

The Standard also the same date advanced Smackover, Ark. crude 10 cents, to new price of $0.55 per barrel.

Meeting the Standard of Louisiana advance on Nov. 4 were the Magnolia Petroleum Co., which however, posts flat prices rather than a gravity schedule; the Louisiana Oil Refining Corp., Atlantic Oil Producing Co., The Texas Co. and the Gulf Refining Co. of Louisiana.

The Louisiana Oil Refining Corp. and Atlantic Oil Producing Co. also advanced Stephens, Ark. crude 10 cents, to new price of $0.51 for below 29, and $0.54 for 29 and above.

The Louisiana Oil also advanced Urania, La., crude 10 cents, to new price of $0.55 per barrel.

DENVER—Nov. 2—Midwest Refin-

(Continued on page 105)

FORWARD!

BETWEEN October 19th and November 25th America will feel the thrill of a great spiritual experience. In those few weeks millions of dollars will be raised in cities and towns throughout the land, and the fear of cold and hunger will be banished from the hearts of thousands.

Be sure that you do your part. Give to the funds that will be raised in your community. Give liberally.

And know that your gift will bless yourself. It will lift your own spirit. More than anything else you can do, it will help to end the depression and lay the firm foundation for better times.

The President's Organization on Unemployment Relief

WALTER S. GIFFORD
Director

Committee on Mobilization of Relief Resources

OWEN D. YOUNG
Chairman

The President's Organization on Unemployment Relief is non-political and non-sectarian. Its purpose is to aid local welfare and relief agencies everywhere to provide for local needs. All facilities for the nation-wide program, including this advertisement, have been furnished to the Committee without cost.

Crude Oil Prices (in Effect Nov. 9, 1931)

(Prices are per barrel at the well)

(Crude Oil Prices for the whole year in OIL PRICE HANDBOOK published annually)

ROCKY MOUNTAIN FIELDS

(Posted by Midwest Refining Co.)

Effective Nov. 2, 1931

Salt Creek, Wyo.:

Below 29°	$0.61	32-32.9	$0.69
29-29.9	0.63	33-33.9	0.71
30-30.9	0.65	34-34.9	0.73
31-31.9	0.67	35-35.9	0.75
36-36.9	$0.77	39-39.9	$0.83
37-37.9	0.79	40 and above	0.85
38-38.9	0.81		

Effective Nov. 3, 1931

Cat Creek, Mont.	$1.05
Hogback, N. Mex.	0.80
Hobbs, N. Mex. (Effective Nov. 2, 1931)	0.50

(Posted by Ohio Oil Co.)

Effective Nov. 3, 1931

Elk Basin, Wyo.	$1.05
Grass Creek Light	1.05
Mig Muddy	0.83
Lance Creek	1.05
Rock Creek	0.85
Sunburst, Mont.	1.00

CALIFORNIA CRUDE

††Standard Oil Co. of California

Effective June 19, 1931

Gravity	Signal Hil *Seal Beach *Alamitos Heights	Huntington Beach	Inglewood	Playa del Roy	Olinda-Brea Canon	Elwood Terrace	Torrance	Richfield	†Whittier †La Habra Montebello	Coyote Hills	Santa Fe Springs	Newhall McKittrick Kern River	Midway Sunset Elk Hills Buena Vista Hills	Lost Hills	Coalinga	Wheeler Ridge	**Athens **Rosecrans **Dominguez	**Santa Paula	**Orcutt
14-19.9	$0.65	$0.65	$0.65	$0.65	$0.65	....	$0.65	$0.65	$0.65	$0.65	....	$0.55	$0.55	$0.55	$0.55	$0.55	....	$0.65	$0.55
20-20.9	.65	.65	.66	.65	.66	....	.65	.65	.65	....	....	.55	.55	.55	.55	....	....	.65	.56
21-21.9	.65	.65	.68	.66	.67	....	.65	.66	.65	.65	....	....	.55	.57	.55	.55	....	.65	.57
22-22.9	.65	.66	.70	.67	.68		.66	.68	.65	.65	....	....	.56	.59	.55	.55	....	.65	.59
23-23.9	.67	.68	.72	.68	.70		.67	.70	.65	.66	....	....	.58	.60	.55	.55	....	.65	.61
24-24.9	.69	.70	.74	.69	.72		.68	.72	.65	.67	$0.65	....	.61	.62	.55	.55	$0.69	.66	.63
25-25.9	.71	.72	.76	.70	.74		.70	.74	.65	.69	.65	....	.64	.64	.57	.55	.71	.68	.65
26-26.9	.73	.74	....		.76	....	....	....	....	.71	.65	....	.66	.66	....	....	.73	.70	.67
27-27.9	.75	.76	....		.78	....	....	....	....	.73	.68	....	.68	.67	....	....	.75	.72	....
28-28.9	.77	....	....		.80	....	....	....	....	.75	.71	....	.71	.69	....	....	.77	.74	....
29-29.9	.79	....	....		....	....	....	....	....	.77	.73	....	.74	.71	....	....	.79	.76	....
30-30.9	.81	....	....		....	....	....	....	....	.79	.75	....	.76	.72	....	....	.81	.78	....
31-31.9	....	....	....		....	....	....	....	....	....	.78	....	....	....	....	....	.83	....	....
32-32.9	....	....	....		....	....	....	....	....	....	.80	....	....	....	....	....	.85	....	....
33-33.9	....	....	....		....	$0.79	....	....	....	....	.83	....	....	....	....	....	.87	....	....
34-34.9	....	....	....		....	.81	....	....	....	....	.86	....	....	....	....	....	.89	....	....
35-35.9	....	....	....		....	.84	....	....	....	....	.87	....	....	....	....	....	....	....	....
36-36.9	....	....	....		....	.87	....	....	....	....	....	....	....	....	....	....	....	....	....

*Seal Beach and Alamitos Heights prices end with $0.75 for crude 27 and above.

†Whittier and La Habra crude ends with 22-22.9 gravity.

**Posted by Union Oil Co. of California, effective June 20, 1931.

††Postings on Kettleman Hills, Ventura Avenue, Athens-Rosecrans and Dominguez discontinued by Standard. Kettleman Hills, 30 and above, posted at 66 cents by Assosiated Oil Co. and General Petroleum Co., June 19, 1931.

REFINERS' and COMPOUNDERS' SUPPLIES

Following are average market prices for materials used by refiners and compounders effective on the date shown.

Refiners' Supplies

	Nov. 9	Nov. 2
Soda Ash Light 58% bags, cwt.	$1.15-1.38	$1.15-1.38
Silicate of Soda 60 deg. drums ....cwt.	$1.75-1.90	$1.75-1.90
Silicate of Soda 40 deg. tank cars....cwt.	$0.70	$0.70
Silicate of Soda 40 deg. drums ....cwt.	$1.00	$1.00
Sal Soda wks....	$0.90-1.20	$0.90-1.20
Caustic Soda 76% solid..cwt.	$2.25-2.50	$2.25-2.50
Sulfuric Acid 60 deg. tank cars, f. o. b. shipping point per ton....	$11.00-12.50	$11.00-12.50
Sulfur, flowers of.....cwt.	$3.10-4.00	$3.10-4.00
Liquid Chlorine, tank cars, wks....lb.	1.75	1.75

Compounder's Supplies

	Nov. 9	Nov. 2
Vegetable Oils		
Linseed carloads, spot.....lb.	7.60-7.80	7.40-7.50
Tanks, spot....	7.00-7.20	6.80-6.90
Soya Bean, Tank, coast...lb.	5.00	5.60
Oleic Acid		
Distilled, tanks....lb.	6.50	6.50
Distilled, bbls....lb.	7.375	7.375
Saponified, tanks....lb.	6.75	6.75
Saponified, bbls....lb.	7.625	7.625
Lard Oils		
Prime Winter Strained....lb.	12.00	12.00
Extra Winter Strained....lb.	8.25	8.25
Extra....lb.	8.00	8.00
Extra No. 1....lb.	7.50	7.50
No. 1....lb.	7.25	6.25
No. 2....lb.	7.00	7.00
Tallow oil....lb.	7.00	7.00
Neatsfoot Oil		
Pure, bbls....lb.	9.50	9.50
Extra, bbls....lb.	7.25	7.25
No. 1 bbls....lb.	7.00	7.00
Cold Pressed....lb.	13.50	13.25
Fish Oils		
Menhaden Oil		
Light Pressed....gal.	33–34	33–34
Light Pressed, tank cars, N. Y....gal.	27–28	27–28
Yellow bleached....gal.	36–37	36–37
Whale, extra winter bleached, ...gal.	61–63	61–63
Naval Stores		
Steam distilled turpentine, N. Y....gal.	40	40
Steam, distilled turpentine, Savannah....gal.	37	37
Gum turpentine, N. Y....gal.	50	50
Gum turpentine, f.o.b. cars Savannah....gal.	44	44
Wood Rosin, N. Y....bbl.	$4.65	$4.65
Wood Rosin F, Savn'h...bbl.	$4.55	$4.55
Gum Rosin B, N. Y....bbl.	$3.85	$3.95
Gum Rosin B, f.o.b. cars Savannah....bbl.	$3.10	$3.20
Rosin oil, pure....gal.	47	47
Rosin, oil, compounded..gal.	41	41
Pine Tar		
Kiln burnt....	$10.00-11.00	$10.00-11.00
Retort....bbl.	$11.00-12.00	$11.00-12.00
Alcohol		
Denatured Formula 5, in tanks, per gal....	24	24

Crude Price Changes

(Continued from page 103)

ing Co. advanced all grade of Salt Creek, Wyo., crude 15 cents. Its prices and gravity schedule conform to those of the Stanolind and other purchasers of Mid-Continent crude.

It also advanced Hobbs, N. Mex. crude 15 cents, to new price of $0.55 per barrel.

On Nov. 3 the Midwest advanced Elk Basin and Grass Creek, Wyo. and Cat Creek, Mont. 15 cents, to new price of $1.05 per barrel.

PITTSBURGH—Nov. 7 Joseph Seep Purchasing Agency advanced Corning, O. crude 5 cents, to new price of $0.85 per barrel.

LOUISVILLE—Nov. 9 Stoll Oil Refining Co. advanced Stoll Pipe Line oil in Kentucky 15 cents, to new price of $0.75 per barrel.

OIL STOCKS AND FINANCES

Standard of California Profits

$6,297,819 the Third Quarter

LOS ANGELES, Nov. 6

NET profit of the Standard Oil Co. of California the third quarter of 1931 was $6,297,819 after depreciation, depletion, amortization, estimated income tax and the quarter's proportion of inventory adjustment. The third quarter of 1930 the company had a net profit of $10,717,-039.

Income of the third quarter was equivalent to 48 cents a share on 13,102,900 shares of capital stock, contrasted with 83 cents on each of the 12,845,980 shares outstanding a year before.

The first nine months of 1931 the company's net profit totaled $11,941,-787, against $30,435,563 for a corresponding period in 1930, a decrease of $18,493,776 or slightly over 60 per cent. Nine month's proportion of inventory revaluation had been deducted from earnings this year.

Income for the three quarters totaled 91 cents a share on 13,102,900 shares, as compared with $2.37 a share earned on 12,845,980 shares in the first nine months of 1930. Dividend requirements were $1.875 for the three quarters.

* * *

CLEVELAND, Nov. 7. — Standard Oil Co. of Kansas reports net earnings of $197,203 after depreciation and taxes for the third quarter of 1931. Earnings report for the preceding quarter is not available for comparison but in the first six months of this year the company lost $930,458 on its operations. In the whole of 1930 the company's net earnings amounted to $380,148.

The Standard of Kansas was one of several oil companies that reported improvement in operating results the third quarter. Most companies whose income statements were issued the last week, showed an upturn over earnings earlier this year but income was still under that of the third quarter of 1930.

Amerada Corp. reported a loss of $489,835 for the third quarter, compared with a loss of $536,450 the second quarter and profit of $3,772,810 the third quarter of 1930.

In the first nine months of this year Amerada had a loss of $968,061 after depreciation, depletion and drilling expenses, compared with net income of $4,173,871 the first nine months of 1930. The latter sum included a nonrecurring profit from the sale of a half interest in its Kettleman Hills lease to the Union Oil Co. of California.

Continental Oil Co. reported a net loss of $2,955,322 for the third quarter of 1931, compared wih a loss of $4,037,698 the preceding quarter and a profit before federal taxes of $1,358,-974 the third quarter of 1930.

The first nine months of 1931 Continental had a loss of $9,484,163 after reserves and minority interests in subsidiary companies' profits, compared with a profit of $4,002,794 before federal taxes the first nine months of 1930.

Houston Oil Co. of Texas and the Houston Pipe Line Co. reported consolidated net loss of $410,718 after reserves in the third quarter, compared with net income of $233,509 the second quarter and $292,625 the third quarter of 1930. The same companies in the first nine months of 1931 had net income of $51,494, compared with $1,307,042 the first nine months of 1930.

Panhande Producing & Refining Co. had a net loss of $94,196 the third quarter, compared with a net loss of $168,121 the second quarter and $211,430 the third quarter of 1930. In the nine months the company had a net loss of $388,874, compared with a net loss of $247,972 the first nine months of 1930.

Detailed report of Seaboard Oil Co. of Delaware shows net income of $54,-242. This amount is slightly better than the estimate of third quarter earnings which was published a week ago. The second quarter this company had a net loss of $34,917 and a net profit of $113,863 the third quarter of 1930. For the nine months Seaboard had a net profit of $72,480, compared with $679,529 the first nine months of last year.

Shell Union Oil Corp. and subsidiaries report consolidated net loss of $2,681,620 for the third quarter. Shell's net loss the second quarter was $11,056,034. In the third quarter of 1930 its net profit was $1,107,659.

Shell's net loss for the first nine months of this year was $23,641,126, compared with a net profit of $826,678 the first nine months of 1930.

The Shell Pipe Line Corp. had a net profit of $3,403,578 the third quarter of 1931, compared with net profit of $3,726,448 the second quarter and $3,810,640 the third quarter of 1930. In nine months this year the pipeline's net profit was $10,928,011, compared with $11,544,658 the first nine months of 1930.

Simms Petroleum Co. had a net loss of $657,854 the third quarter, including a loss of $88,919 on the sale of property. In the second quarter its net loss amounted to $1,303,277 and in the third quarter of 1930 $154,760.

Prairie Pipe Line Co. reported net profit of $342,000 the third quarter, as against $1,315,300 the second quarter and $3,491,150 the third quarter of 1930. In nine months Prairie Pipe Line Co. had a net profit of approximately $3,550,000, compared with $14,041,400 in the first nine months of 1930.

Pierce Petroleum Co. reported a net loss of $8,474 for the third quarter but a net profit of $271,966 for the first nine months.

Pierce Oil Corp. reported a total income, from interest, of $553 for the third quarter and a total income of $111,652 for the nine months.

Republic Petroleum Co. of Los Angeles reported a nine-month net income of $273,522, compared with $261,760 in the corresponding time of 1930.

Royal Dutch and Shell Omit Dividends

NEW YORK, Nov. 7.—Dispatches from Amsterdam and London report the omission of the interim dividends by the Royal Dutch Co. and the Shell Trading & Transport Co. In previous years the two companies have declared a 10 per cent interim dividend payable in January. The annual dividends, declared after the results of the year are known, are paid in mid-summer.

Extra Dividend Continued By S.O. New Jersey

NEW YORK, Nov. 7.—Standard Oil Co. (N. J.) has declared the usual extra dividend of 25 cents a share and the regular dividend of the same amount. As the extra involves an outlay of almost $6,500,000 a quarter its continuance at this time has been interpreted to mean the directors of the largest oil company are optimistic of the immediate future.

Directors of the Socony-Vacuum Corp., however, at their meeting this week reduced the quarterly rate from 40 to 25 cents.

Standard Oil Co. of California is maintaining its regular rate of 62½ cents a quarter but it is omitting this year a stock dividend of 2 per cent which it declared at the end of 1929 and 1930.

Sun Oil Co. which paid stock dividends of 9 per cent at the end of 1929 and 1930 omitted such distribution this year.

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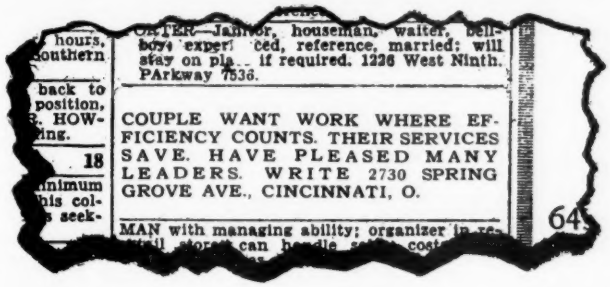
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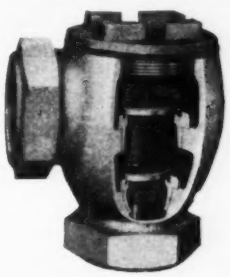

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Transactions in Oil Shares on New York Stock Exchange

1930 High	1930 Low	1931 High	1931 Low	Listed Shares	Par Value	Company	Div. Rate Period	Last Div. Paid	Transactions Week Ended Nov. 7 Sales Shares	High	Low	Last	Week's Change
31½	16½	23	13	922,075	N.P.	Amerada Corp.	50cQ	Oct. 30, 31	2,100	16½	14½	16½	+ 1⅜
37	5⅞	12⅜	2¼	209,180	N.P.	American Republics Corp.	....	.....	200	2⅛	2½	2½	0
51	30	31	9	2,240,000	$25	Associated Oil Co.	....	June 30, 31	.....	.....	.....	.....	.....
51⅜	16⅝	23⅝	10	2,696,650	25	Atlantic Refining Co.	25cQ	Sept. 15, 31	24,800	15⅞	13⅜	15½	+ 2⅛
34	8⅝	14½	4¾	2,257,705	25	Barnsdall Corp. A	....	May 11, 31	38,600	7⅞	6½	7⅞	+ 1⅜
35	21	25	12	2,060,966	25	California Petroleum Corp.	....	Jan. 1, 29	.....	.....	.....	.....	.....
20⅝	8¾	10¼	7½	1,444,970	N.P.	Colonial Beacon Oil Co.	....	.....	300	9	9	9	— 1
30½	7¾	12	5	4,720,640	N.P.	Continental Oil Co. (Del.)	....	.....	47,500	9¼	8	9	+ ⅛
71⅛	22⅜	47	9⅝	413,333	N.P.	General Asphalt Co.	50cQ	Sept. 15, 31	7,600	18⅛	16	17¾	+ 1⅞
116⅞	29¼	68½	19	96,475	$100	Houston Oil Co.	....	.....	21,100	33⅜	29⅜	32	+ 1⅜
11¾	6⅜	14⅛	4	675,434	25	do new	....	.....	12,400	6⅜	5⅞	6½	+ ⅜
28⅜	3	4⅝	1⅝	556,546	10	Indian Refining Co.	....	Dec. 15, 20	1,300	2⅜	2	2⅜	— ⅛
12	3½	4½	1⅜	1,309,100	N.P.	Louisiana Oil Refg. Corp.	....	.....	400	2	1¾	2	+ ⅜
90	66	55	34	40,000	$100	do pfd.	$1.62½Q	Aug. 15, 31	.....	.....	.....	.....	.....
10⅜	1¾	3¾	½	330,000	N.P.	Maracaibo Oil Exploration Co.	....	.....	1,900	1	⅞	1	+ ⅛
182	150	171	90	459,428	$100	Mexican Petroleum Co.	....	Apr. 20, 31	.....	.....	.....	.....	.....
100	100	100	100	120,000	100	do pfd.	$2Q	Oct. 20, 31	.....	.....	.....	.....	.....
33	11	16¾	5	1,857,912	N.P.	Mid-Continent Petroleum Corp.	....	Feb. 16, 31	22,300	9½	7⅝	8⅞	+ 1⅜
32	16	19½	6½	6,648,052	N.P.	Ohio Oil Co.	....	Mar. 14, 31	52,500	10½	8½	10¼	+ 1½
64¼	42	35⅛	20	1,000,000	$50	Pan Amer. Pet. & Trans. Co.	40cQ	Oct. 20, 31	.....	.....	.....	.....	.....
67½	30	36½	20	2,473,916	50	do B non-voting	40cQ	Oct. 20, 31	200	24⅛	23½	24⅛	+ 2
12¾	1¾	4¼	¾	199,370	N.P.	Panhandle Prod. & Refg. Co.	....	.....	400	1⅝	1½	1⅝	+ ⅛
80	47½	20	9½	25,666	$100	do pfd.	....	July 2, 23	400	12	9½	12	+ 2½
27¼	5⅞	10⅞	4¼	2,551,084	N.P.	Petroleum Corp. of America	....	June 1, 31	44,500	8¼	5¾	7⅞	+ 2⅛
44⅜	11½	16⅝	4⅜	4,419,262	N.P.	Phillips Petroleum Co.	....	Jan. 2, 31	46,200	8⅝	7	8⅝	+ 2
2½	½	1½	⅜	1,184,917	$25	Pierce Oil Corp.	....	.....	7,200	¾	†⅜	¾	+ ⅛
52	7½	23¾	5⅛	150,000	100	do pfd.	....	Feb. 1, 22	1,200	10¾	8½	10	+ 1½
7⅛	1⅜	3⅜	⅞	2,500,000	N.P.	Pierce Petroleum Corp.	....	Feb. 16, 31	19,000	1⅝	1¼	1⅝	+ ⅛
54	11¼	20⅜	5½	2,441,432	$25	Prairie Oil & Gas Co.	....	Mar. 31, 31	7,200	9⅜	8⅛	9¼	+ 1⅛
60	16⅝	26½	7⅝	4,050,000	25	Prairie Pipe Line Co.	....	July 1, 31	9,100	11⅝	9½	11⅝	+ 2⅛
11⅞	1	6	1½	749,017	50	Producers & Refiners Corp.	....	Sept. 15, 23	300	2	2	2	+ ⅛
40	11½	16	4¼	56,907	50	do pfd.	....	May 4, 25	350	7	6½	6⅝	+ 1⅝
27¼	7⅝	11⅞	5	3,038,370	25	Pure Oil Co.	....	Sept. 1, 30	14,500	7½	6⅜	7¼	+ 1
114¼	90½	101⅞	64½	130,000	100	do 8% pfd.	$2Q	Oct. 1, 31	30	73	73	73	+ 3
28¼	4⅞	6⅜	⅞	2,126,250	N.P.	Richfield Oil Co. (California)	....	Sept. 1, 30	1,500	1	⅞	⅞	0
25¾	5	10¼	2⅛	1,235,814	N.P.	Rio Grande Oil Co.	....	July 25, 30	10,000	3⅛	2¾	3⅛	0
56½	36⅞	42⅝	13½	617,443	$13.40	Royal Dutch Co. (N. Y. Shares)	93.85c	Aug. 4, 31	8,100	18⅝	17⅜	18⅝	+ 1⅛
37	9¾	20¾	5½	1,244,383	N.P.	Seaboard Oil of Del	....	Oct. 15, 24	37,800	10⅜	8⅞	9¾	+ ⅜
48⅜	26	34	9¾	63,852	£2	Shell Transp. & Trading Co.	72.6c	July 23, 31	18	10¼	10¼	10¼	— 3¾
25½	5¼	10¼	3¼	13,070,625	N.P.	Shell Union Oil Corp.	....	June 30, 30	36,500	5¾	4¾	5¾	+ ½
106¼	55	78	23¾	400,000	$100	do pfd.	....	July 1, 31	2,700	37¾	31	37¾	+ 6¾
37	5⅜	11	4¼	869,271	10	Simms Petroleum Co.	....	Sept. 15, 30	20,100	7¼	5	7	+ 1¾
32	9¾	15⅞	5½	6,103,263	N.P.	Sinclair Cons. Oil Corp.	....	Apr. 15, 31	132,600	9¼	7⅜	8⅞	+ 1½
112¼	86	103	77	141,294	$100	do pfd.	$2Q	Aug. 15, 31	300	87	87	87	+ 1½
42	10⅛	12⅞	3⅜	1,000,069	25	Skelly Oil Co.	....	Dec. 15, 30	4,700	5⅞	4¾	5⅞	+ 1⅝
99¾	42	62	10	120,000	100	do pfd.	....	May 1, 31	1,000	23	17	23	+ 6¾
.....	.....	21	12⅛	31,273,328	25	Socony Vacuum Corp.	40cQ	Sept. 15, 31	68,000	15½	14¼	15⅜	+ ⅝
106⅜	98	105¼	88½	764,935	100	S. O. Export Corp. pfd.	$2.50S.A.	June 30, 31	1,100	95	93⅞	95	+ ⅞
75	42¼	51¾	28¾	13,102,900	N.P.	S. O. California	62½cQ	Sept. 15, 31	63,800	36¼	33⅞	36	+ 2
49	14⅜	19	8¼	320,000	$25	S. O. Kansas	....	Mar. 16, 31	2,600	12¼	10¼	12¼	+ 2
84⅞	43½	52½	28¼	25,639,466	25	S. O. New Jersey	††25cQ	Sept. 15, 31	116,900	37½	34¾	37⅛	+ 2⅜
70	39	45¼	26¾	1,544,349	N.P.	Sun Oil Co.	25cQ	Sept. 15, 31	400	32⅜	32⅛	32⅜	+ ⅜
108¼	97¾	104½	89	100,000	$100	do pfd.	$1.50Q	Sept. 1, 31	20	92	90	92	+ 2
9⅝	¾	1¾	½	776,979	N.P.	Superior Oil Corp.	....	.....	700	¾	⅝	¾	0
60½	28¼	36¼	15	9,851,211	$25	The Texas Corp.	50cQ	Oct. 1, 31	48,400	21⅜	19⅜	21	+ 1½
14½	4	6½	2½	930,432	10	Texas Pacific Coal & Oil Co.	....	Dec. 31, 29	6,900	3½	3⅛	3½	+ ½
17⅜	5⅞	9	3½	5,997,872	N.P.	Tide Water Associated Oil Co.	....	Feb. 16, 31	18,400	5¼	4¼	5	+ 1
89¾	53	68	20½	732,649	$100	do pfd.	$1.50Q	Oct. 1, 31	2,000	33	25½	33	+ 7½
31	12	18	10½	2,191,823	N.P.	Tide Water Oil Co.	....	June 30, 31	300	9⅞	9⅞	9⅞	— 3⅛
94⅞	68	83	35	199,446	$100	do pfd.	$1.25Q	Aug. 15, 31	200	38	38	38	+ 1
50	20⅛	26⅝	11¾	2,225,302	25	Union Oil Co. of California	50cQ	Nov. 10, 31	14,000	18	15¼	17⅜	+ 1⅜
38½	23	25⅛	18½	1,254,048	N.P.	Union Tank Car Co.	40cQ	Sept. 1, 31	1,600	20	18⅝	20	+ 1½
27	4¼	7⅜	1	769,531	N.P.	Warner Quinlan Co.	....	July 3, 30	1,800	3	2⅜	3	+ ⅝
21	6½	9⅜	3	428,967	N.P.	H. F. Wilcox Oil & Gas Co.	....	May 10, 28	2,300	5¼	4¼	5¼	+ 1¼

*New high †New low ††Also extra—S. O. New Jersey 25c. Total sales 987,918.

New York Curb Bonds

Week Ending Nov. 6

	High	Low	Last	Change
Cities Serv. 5s '66	55	51⅞	55	—1½
Cities Serv. 5½s '50	57¼	32⅜	57	+4
Cities Serv. G. 5½s '42	56	51¾	56	+4
Cities Serv. G. P. 6s '43	61	58⅜	61	+1¾
Cont. Oil 5¼s '37	85	83¾	83¾	+ ½
Empire O & R 5½s '42	49½	44½	49½	+4⅝
Gulf Oil 5s '37	99¾	98⅛	99¾	+1¾
Gulf Oil 5s '47	97	96	97	+ ⅞
Indep. Oil 6s '39	83½	81⅞	81⅞	+4⅛

Pittsburgh Stock Exchange

Transactions Week Ended Nov. 6, 1931

	Sales	High	Low	Last	Change Over Week
Ark. Nat. Gas	60	2⅝	2¾	2¾	— ¼
do pfd	575	5	5	5	0
Devonian Oil	10	4¼	4¼	4¼	+ ¼
Leonard Oil & Dev.	2,000	.40	.40	.40	0
Lone Star Gas	6,377	10	9¼	9⅞	+ ⅝
Salt Creek Cons.	1,620	3	2½	2⅞	+ ⅛
Western Pub. Serv.	1,470	5	4¾	5	0
Pittsburgh Curb					
Gulf Oil Corp.	5,000	51¼	51¼	51¼	....

Cleveland Stock Market

Nov. 6, 1931

	Bid	Asked	Last Sale
Canfield Oil	50	75⅜	85
Fred G. Clark	¾	1⅛	1⅛
National Refining	8	8⅛	8
do pfd	..	110	119

Latest Changes in Tank Wagon Prices

(*Continued from Page* 101)

NAPHTHA PRICES

	Oleum Spirits	V.M.&P. Naphtha	Cleaner Naphtha
Chicago	11.7	13.7	15.2
Detroit	14.4	15.9	16.7
Kansas City	†12.9	†14.4	†15.2
Milwaukee	13.4	*16.9	*17.7
Minneapolis	**17.7	**19.2	**20
St. Louis	12.6	14.1	14.9
New York		12	17
Boston		17	17

*Includes 2c state tax. †Includes 1c city tax.
**Includes 3c state tax.

Petroleum Spirits (Solvent)

Tank Cars (F.o.b. refinery or seaboard terminal)	
New York Harbor	9.00
Philadelphia district	9.00
Providence	9.50
Tank Wagon or Steel Barrels	
New York City	12
Syracuse	17
Rochester	14
Buffalo	‡14
Providence	17
Boston	17
Bridgeport	15
Newark	16
Philadelphia	13
Lancaster	17
Altoona	17
Baltimore	16

Note: 2c off above t.w. prices to large buyers in some instances.
‡Buffalo price is net.

Aviation Gasoline Prices

Following are tank wagon prices of aviation gasoline in principal marketing territories showing state and municipal taxes:

S. O. NEW JERSEY

Prices in Effect Nov. 9, 1931

	T.W.	Tax	Total T.W.
Newark, N. J.	14.9	*	14.9
Baltimore, Md.	15.2	4	19.2
Washington, D. C.	15	2	17

*New Jersey road tax of 3c does not apply on aviation gasoline, exemption being claimed at time of purchase.
All above prices are on Stanavo Aviation Gasoline

COLONIAL BEACON OIL CO.

New York City	16	2	18
Boston, Mass.	18	3	21

S. O. PENNSYLVANIA

Philadelphia, Pa.	15	3	18
Pittsburgh, Pa.	15	3	18
Altoona, Pa.	15	3	18

S. O. OHIO

Thru Ohio	14	4	18

Discounts given by S. O. Ohio: For delivery to airports only; 2,000 gals. or over per month, 1c per gal.; 6,000 gals. or over per month, 2c; 12,000 gals. and over per month, 3c; 24,000 gals. and over per Month, 4c.

Aviation Gasoline Prices

(Continued from preceding page)

S. O. INDIANA

	T.W.	Tax	Total T.W.
Chicago	15	3	18
Indianapolis, Ind	15.3	4	19.3
Detroit, Mich	15.8	3	18.8
Milwaukee, Wis	15.1	2	17.1
Minneapolis, Minn	16.2	3	19.2
St. Louis, Mo	14.4	2.5	16.9
Kansas City, Mo	14.9	3	17.9
Fargo, N. D.	17.9	3	20.9
Huron, S. D.	16.3	4	20.3
Wichita, Kan	13.8	3	16.8

In S. O. Indiana territory, buyer pays state and city taxes on aviation gasoline, and if he can get a refund from the state, he does so. Kansas City tax of 3c includes 1c city tax; St. Louis tax of 2.5c includes ½c city tax.

S. O. LOUISIANA

New Orleans, La.	18	6	24
Nashville, Tenn.	20	6	26
Memphis, Tenn.	19	6	25

2c per gal. discount off above posted retail t.w. prices to dealers and commercial consumers.

S. O. NEBRASKA

Omaha	16.25	4	20.25

2c per gal. refund to reseller.

CONTINENTAL OIL CO.

Denver, Colo.	13	4	17
Cheyenne, Wyo.	15	4	19
Helena, Mont.	19	5	24
Salt Lake City, Utah	16.5	4	20.5
Albuquerque, N. M.	17	5	22
Boise, Ida.	18.5	5	23.5

S. O. CALIFORNIA

Phoenix, Ariz.	17.5	4	21.5
Los Angeles, Cal.	16.5	3	19.5
San Francisco, Cal.	17	3	20
Reno, Nev.	21	4	25
Portland, Ore.	17.5	4	21.5
Seattle, Wash.	17.5	3	20.5
Spokane, Wash.	21.5	3	24.5

Note: 4c per gallon added to t.w. price, in S. O. California territory, to customers taking delivery direct into the fuel tank of planes.

P. F. Cosgrove Injured

NEW ORLEANS—P. F. Cosgrove, representative for the Wayne Co. in the southeast, was injured in an automobile accident near Meridian, Miss., late in October. Mr. Cosgrove was cut about the body, and was in a hospital in Meridian for several days. He is at home now, and expects to be out in the next week. A friend, Tom Ewing, was killed in the accident.

Elected Traffic Club Officer

TULSA, Oct. 31.—H. W. Roe, traffic manager for the Mid-Continent Petroleum Corp., was elected an executive vice-president of the Associated Traffic Clubs of America at the annual convention held this week in Tulsa. Mr. Roe was general chairman of the committee on arrangements and entertainment for the convention.

NEW YORK—Heading the Montana code committee of the American Petroleum Institute, is J. M. Anderson, Shell Oil Co., Missoula, Mont., recently appointed chairman.

W. B. Cline, Shell Petroleum Corp., Minneapolis, has been made a member of the Minnesota and North Dakota code committees.

C. E. Doud, Sun Oil Co., Chicago, is a newly appointed member of the Illinois code committee.

THE OIL INDUSTRY EXCHANGE

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EXPERIENCED MARKETER petroleum products desires permanent connection. Twenty years experience in bulk and service station sales, refinery sales, lubrication and grease manufacture. Address Box 771.

NINE YEARS INTENSELY PRACTICAL EXPERIENCE, oil absorption, compression and charcoal plants, loading racks to superintendent. Exceptional reference. Address Box 800.

CONSTRUCTION SUPERINTENDENT, 18 years experience, terminal plants, bulk plants, service stations, wishes connection with petroleum company, anywhere. Address Box 803.

TO THE REFINER OF GASOLINE OR LUBRICATING OILS who wants a salesmanager who has intimate knowledge of jobbers in the Mid-Continent field and who has a successful sales record direct with the jobber. Best references. Available on or after November 15th. All communications will be considered confidential. Address Box 804.

EXECUTIVE with twenty years intensely practical experience in securing and handling salesmen, credits and collections in sales of lub oils, roof cement and paints to consuming trade principally. Address Box 801.

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All advertisements carried on this page are payable in advance.

Advertisers having box numbers should be addressed in care of National Petroleum News, 1213 West 3rd Street, Cleveland, Ohio, unless otherwise specified.

Wanted to Buy

PARAFFINE WAX MOLDING MACHINE. One hundred plate ten-and-quarter-pound commercial cake. Must be in good condition; state length time in service. Price for immediate cash disposal. Advise all particulars in details. Address Box 802.

GASOLINE PUMPS WANTED

Will buy upward to 50 Wayne late No. 515, No. 615 and 628 Model Gasoline Pumps. Give full information, conditions, model and price wanted in first letter.

Address Box 805

For Sale

CALL FOR BIDS to Purchase Royalty Oil Accruing to the United States from the Salt Creek, Wyoming, oil field. Pursuant to the provisions of Section 36 of the act approved February 25, 1920 (41 Stat., 437), sealed proposals, in duplicate, will be received in the office of the Secretry of the Interior, Washington, D. C., on or before noon on December 1, 1931, from responsible bidders for the purchase, for a period beginning January 1, 1932, of all royalty oil accruing to the United States from Government lands in the Salt Creek, Wyoming, oil field. For the calendar year 1930 the total Government royalty oil from Salt Creek field amounted to approximately 1,325,000 barrels, and for the period from January 1 to July 31, 1931, to approximately 666,000 barrels, about 14 per cent of the production of the field, the average gravity in both years being in the range from 36.0 to 36.9 degrees A. P. I. Additional information may be obtained from the Director, Geological Survey, Department of the Interior, Washington, D. C., or the Supervisor, Geological Survey, Casper, Wyoming. Bids are invited on three separate items as follows: Item 1. Royalty oil for the period beginning January 1, 1932, and ending December 31, 1932. Item 2. Royalty oil for the period beginning January 1, 1932, and ending December 31, 1934. Item 3. Royalty oil for the period beginning January 1, 1932, and ending December 31, 1936. Bids must be in the following form: For the period beginning January 1, 1932, and ending December 31, 193—, (name of bidder), offers ——— cents per barrel above the highest field price for oil of equal or lower gravity in Oklahoma and Kansas, and/or in Wyoming, whichever is the higher, as published or offered by any responsible recognized purchaser for crude oil in quantity not less than 2,000 barrels a day." Delivery of royalty oil will be made in the field without cost to the Government to the successful bidder or for his account. Payments for the royalty oil are to be made to the Register of the United States Land Office, Cheyenne, Wyoming, on or before the fifteenth day of each month following that in which delivery is made. The quantity and quality of the oil will be determined by tank measurement and suitable tests, the measured quantity will be corrected for impurities in excess of one-half on one per cent, and the volume computed in terms of standard barrels at 60°F. Each bidder must submit with his bid a bond in the sum of $1,000 or a certified check payable to the order of the Secretary of the Interior in the sum of $1,000 as a guarantee that he will, if successful, promptly execute a satisfactory contract and furnish a bond in the sum of at least $250,000, conditioned upon full and complete compliance with the terms of the contract. The Secretary of the Interior may accept the offer of the highest bidder and/or bidders and reserves the right to reject all bids whenever within his judgment the interest of the United States demands. Storage facilities are available on Naval Petroleum Reserve No. 3, Wyoming (Teapot), for approximately 1,500,000 barrels of oil. Information in regard thereto may be obtained from the Secretary of the Navy. Sealed bids are to be submitted to the Secretary, Department of the Interior, Washington, D. C., the envelope to be marked plainly "Bid on Salt Creek royalty oil". No bid received after the time herein fixed for submitting bids will be considered. RAY LYMAN WILBUR, Secretary of the Interior.

Standard Oil Stocks on New York Curb Market

1930 High	1930 Low	1931 High	1931 Low	Shares Issued	Par Value	Company	Div. Rate Period	Last Div. Paid	Transactions Week Ended Nov. 7 Sales Shares	High	Low	Last	Week's Change
25	11¼	16	6¼	40,000	$25	Borne Scrymser Co.	....	Oct. 15, 30	.....	....	....	....	....
69	39⅞	56	39	200,000	50	Buckeye Pipe Line Co.	$1Q	Sept. 15, 31	.....	....	....	....	....
184⅞	100¼	129½	88	120,000	25	Chesebrough Mfg. Co.	††$1Q	Sept. 30, 31	.....	....	....	....	....
7⅝	3	3½	1⅝	5,977,873	N.P.	Creole Petroleum Co.	....	.....	19,900	2½	2	2½	+ ½
65¾	20¼	39	20⅝	30,000	50	Cumberland Pipe Line Co.	....	June 15, 31	50	26	26	26	— ½
54¾	26	36	19	50,000	100	Eureka Pipe Line Co.	$1Q	Nov. 2, 31	.....	....	....	....	....
6¾	2½	3	1	280,000	N.P.	Galena Oil Corp.	....	.....	.....	....	....	....	....
119	57¼	72	47¾	2,974,645	$25	Humble Oil & Ref'g. Co.	50cQ	Oct. 1, 31	6,800	61⅞	53¼	61⅞	+ 8
30	15	18½	7⅜	26,557,496	N.P.	Imperial Oil Corp.	12½cQ	Sept. 1, 31	6,400	12	10¾	11½	+ ⅞
28	15	18	7⅛	.....	N.P.	do registered	12½cQ	Sept. 1, 31	100	11⅝	11¼	11⅝	+ 1⅜
41	14½	21⅜	5½	300,000	$10	Indiana Pipe Line Co.	25cQ	Aug. 15, 31	100	8¼	8¼	8¼	— ¼
24	11⅜	15½	7⅜	14,247,088	N.P.	International Petroleum Co.	25cQ	Sept. 15, 31	22,500	12	10½	11⅞	+ 1⅝
22⅜	11½	17½	8⅛	509,000	$12.50	National Transit Co.	25cQ	Sept. 15, 31	200	11	10	11	+ 1½
21	10⅛	14½	5⅞	100,000	10	New York Transit Co.	††15cQ	Oct. 15, 31	900	9	8½	8½	— ½
54	26¼	35½	20	40,000	50	Northern Pipe Line Co.	††$1.50S.A.	July 1, 31	100	*35½	35	35	0
108	100⅜	102⅞	80	579,465	100	Ohio Oil Co. pfd.	$1.50Q	Sept. 15, 31	1,700	85	80½	85	+ 5
32	12	15½	6	400,000	25	Penn Mex. Fuel Co.	50c	Oct. 31, 31	.....	....	....	....	....
33	4⅞	16⅞	3¼	160,000	25	Solar Refining Co.	....	Dec. 20, 29	.....	....	....	....	....
20⅛	6¾	17	9	100,000	10	Southern Pipe Line Co.	50cQ	Sept. 1, 31	100	13	13	13	+ 1
45⅞	18	23⅞	12	1,200,000	25	South Penn Oil Co.	25cQ	Sept. 30, 31	300	15¼	14¼	15¼	+ 1
64	32	42½	25	35,000	50	Southwest Pa. Pipe Lines.	$1Q	Oct. 1, 31	.....	....	....	....	....
59⅞	30	38½	15⅞	16,996,596	25	S. O. Indiana	50cQ	Sept. 15, 31	28,800	23⅞	21⅜	23⅜	+ 2¼
40½	18⅞	23⅜	13¼	2,588,735	10	S. O. Kentucky	40cQ	Sept. 30, 31	5,000	17⅞	24	17¾	+ ⅝
48⅞	34	36½	16½	190,822	25	S. O. Nebraska	50cQ	Sept. 20, 31	200	25	24	25	+ 3½
108½	43¼	62½	35	811,112	25	S. O. Ohio	62½cQ	Oct. 2, 31	600	42½	39½	42½	+ 3½
....	....	115¼	94¼	120,000	100	do 5% pfd.	$1.25Q	Oct. 15, 31	40	91¼	†90¼	90¼	— 4¾
10	4	10	2⅝	34,158	25	Swan Finch Oil Corp.	....	Jan. 15, 29	100	3	3	3	— ½

*New high †New low ††Also extra—Chesebrough 50c; N. Y. Transit 10c; Northern P. L. 50c.

Oil and Royalty Stocks on New York Curb

1930 High	1930 Low	1931 High	1931 Low	Par Value		Transactions Week Ended Nov. 7 Sales Shares	High	Low	Last	Week's Change
4½	½	1⅜	½	N.P.	American Maracaibo	2,800	½	3/8	½	+ 1/8
16¾	4⅝	6½	2⅝	N.P.	Arkansas Nat. Gas	800	3⅛	2⅝	3⅛	+ ¼
16⅝	4⅝	6¾	2	N.P.	do A	10,800	3¼	2½	3¼	+ ½
8⅛	6¼	7	3⅞	$10	do pfd.	1,400	5½	4⅞	5⅜	+ ⅜
1	¼	1	⅛	N.P.	Atlantic Lobos	.....	....	....	....	....
1½	⅛	3¼	¼	$50	do pfd.	.....	....	....	....	....
21	13⅜	16⅞	6¼	N.P.	British American coup.	100	11¼	11¼	11¼	+ 2½
....	....	16¾	10	N.P.	do registered	.....	....	....	....	....
2¾	⅛	2⅜	⅛	$¼	Carib Syndicate	.....	....	....	....	....
44¼	13⅜	20¾	5¼	N.P.	Cities Service	44,700	8¼	7⅜	8¼	+ ⅜
93⅞	78¼	84¾	35⅜	$100	do pfd.	1,200	55½	53¾	55½	+ 1¼
9	7¼	7½	4⅜	10	do pref. B	.....	....	....	....	....
89⅞	80	84	42	100	do pref. BB	.....	....	....	....	....
8¼	1⅜	3⅛	¾	N.P.	Colon Oil Corp.	700	1	⅞	1	+ ¼
21	3⅜	7⅛	1	N.P.	Col. Oil & Gas. vtc.	3,800	2⅛	1¾	1¾	— ½
5⅞	2	2¾	1¼	$1	Consolidated Royalty	.....	....	....	....	....
74¾	1¼	3¾	½	N.P.	Cosden Oil	200	1⅛	1⅛	1⅛	+ ⅛
70	10¼	15	1	$100	do pfd.	.....	....	....	....	....
1	¼	⅝	⅛	N.P.	Crown Central Petrol.	.....	....	....	....	....
21¾	2½	5	2	N.P.	Darby Petroleum	1,800	3	2⅜	2⅝	+ ⅜
11	2	6	1¾	N.P.	Derby Oil & Refining	2,800	3	2⅛	2⅛	— ¼
60	30	40½	25	N.P.	do pfd.	.....	....	....	....	....
106⅞	58½	76	38	$25	Gulf Oil Corp.	11,400	57⅜	51	56¾	+ 5¼
40¾	36	9¾	9¾	....	Honolulu Oil Corp.	.....	....	....	....	....
47¼	12⅝	16⅞	5½	N.P.	Indian Ter. Ill'g. Oil A	200	6¾	6⅝	6⅝	+ ¼
53½	12⅝	16⅞	6⅛	N.P.	do B	900	6⅞	6½	6⅞	+ 1¼
1⅜	⅜	⅝	1/16	$5	Intercontinental Petrol.	7,900	1/16	1/16	1/16	+ ⅛
3	⅞	1⅞	½	N.P.	Kirby Petroleum	.....	....	....	....	....
4¾	½	1½	¼	$25	Leonard Oil Devel.	800	½	⅜	⅜	0
29	4⅞	6¾	2¾	N.P.	Lion Oil Refining	.....	....	....	....	....
55⅞	19⅜	29	7¼	N.P.	Lone Star Gas	3,400	10	9⅜	10	+ ½
31	5½	....	....	$25	MacMillan Petroleum	.....	....	....	....	....
½	⅛	1¾	⅛	$1	Magdalena Syndicate	1,900	1/16	1/16	1/16	— 1/16
16	3	5	2⅝	N.P.	Margay Oil Co.	500	4½	4½	4½	+ ¼
7½	1¾	4⅞	1½	N.P.	Mexico-Ohio Oil	.....	....	....	....	....
....	....	8⅞	2	N.P.	Michigan Gas & Oil	.....	....	....	....	....
11⅞	2¼	4⅝	⅞	N.P.	Mid. States Pet. A vtc.	500	1⅝	1½	1½	0
6	⅝	1½	½	N.P.	do B vtc.	300	⅝	½	½	0
36½	5	11	2	$5	Missouri-Kansas P. L.	3,500	2¾	2	2¼	+ 1/8
6	3/8	5/8	1/16	1	do B vtc.	100	1/8	1/16	1/8	+ 1/16
¾	⅜	⅞	1/16	1	Mountain & Gulf	.....	....	....	....	....
12¼	3¾	5⅞	2½	10	Mountain Producers	1,100	3⅝	3¼	3½	+ ⅜
41⅜	19⅞	26½	11½	N.P.	National Fuel Gas	2,400	15¼	14	14⅞	+ 1⅞
3½	1⅛	1½	½	$5	New Bradford Oil	100	⅝	⅝	⅝	+ 1/8
3⅛	2⅛	2⅛	1½	10	New England Fuel	.....	....	....	....	....
16⅞	4	....	....	25	N. Y. Pet. Royalty	.....	....	....	....	....
....	....	6½	6½	10	N. American Oil	.....	....	....	....	....
11½	2⅛	3¼	1	N.P.	North Central Texas	300	2⅛	2	2	— 1/8
4⅛	⅜	2½	⅜	N.P.	North European Oil	300	½	7/16	7/16	0
11⅝	3⅛	5	1	N.P.	Oilstocks Ltd. A	900	1½	1½	1½	0
11½	4½	5	2½	N.P.	do B	.....	....	....	....	....
19½	5½	15	3	N.P.	Pacific Western Oil	1,400	5¼	4⅛	5⅛	+ 1¼
2½	¼	¾	1/16	N.P.	Pandem Oil	2,100	1/16	1/16	1/16	0
4⅜	1	2	⅜	N.P.	Pantepec of Venezuela	.....	....	....	....	....
5⅞	½	1⅛	¼	....	Petroleum Corp. war.	200	3/8	3/8	3/8	+ 1/8
27½	16¼	19	6	$5	Plymouth Oil	2,100	10	8⅜	10	+ 1⅛
8	3⅛	4½	⅜	N.P.	Producers Royalty	400	⅜	⅜	⅜	0
99	81¾	83½	15¾	$100	Pure Oil 6% pfd.	.....	....	....	....	....
10½	1½	2½	1	N.P.	Red Bank Oil	.....	....	....	....	....
5⅜	⅝	2¼	½	N.P.	Reiter-Foster Oil	1,800	1⅝	1	1⅛	0
23½	6½	11	1	$25	Richfield Oil pfd.	.....	....	....	....	....
25	2¼	5	1¾	N.P.	Root Refining pfd.	.....	....	....	....	....
12¼	5½	3¾	1	$10	Roy. Corp. of Amer. pfd	.....	....	....	....	....
8⅝	2	2⅞	1	N.P.	Ryan Consolidated	.....	....	....	....	....
2½	½	1⅜	¼	$10	Salt Creek Consol.	800	½	3/8	½	+ ¼
15¼	5¼	7⅝	3¾	10	Salt Creek Producers	1,800	4¾	4	4¾	+ ¼
8	1⅜	5¼	2	25	Shreve. El Dorado P.L.	.....	....	....	....	....
17	6	7½	3⅝	N.P.	Southland Royalty	3,100	4⅝	3⅞	4½	+ ¼
10	2	5¼	1/16	$5	Sunray Oil	1,400	1/8	½	½	+ 1/16
19½	8	12⅞	2½	N.P.	Texon Oil & Land	800	6⅛	5⅝	6⅛	+ ⅜
47½	19	24½	11¼	$25	Union Oil Associates	900	15½	14½	15½	+ ½
4½	5/8	1⅞	⅜	5	Venezuela Petroleum	10,600	⅝	½	⅝	+ ⅛
5	2	3½	1⅜	1	Woodley Petroleum	.....	....	....	....	....
2½	⅜	2¼	¼	N.P.	Y Oil & Gas	9,900	⅞	½	¾	— ⅛

*New high †New ow

Oil Dividends

Declared Last Week

Company and Period	Amount	Payable	Stock of Record
Imperial Oil q	12½c	Dec. 1	Nov. 14
McColl Frontenac q	15c	Dec. 15	Nov. 14
Socony Vacuum q	25c	Dec. 15	Nov. 20
S. O. California q	62½c	Dec. 15	Nov. 16
S. O. Indiana q	25c	Dec. 15	Nov. 16
S. O. Nebraska q	50c	Dec. 21	Nov. 27
S. O. New Jersey q	25c	Dec. 15	Nov. 16
do extra	25c	Dec. 15	Nov. 16
Sun Oil q	25c	Dec. 15	Nov. 25
do pfd.	$1.50	Dec. 1	Nov. 10
Union Tank Car q	40c	Dec. 1	Nov. 16

Awaiting Payment

Company and Period	Amount	Payable	Stock of Record
Buckeye Pipe Line q	$1	Dec. 15	Nov. 20
Canadian Oil q	25c	Nov. 14	Oct. 31
Cities Service m	2½c	Dec. 1	Nov. 14
do stock m	½%	Dec. 1	Nov. 14
do pfd. m	50c	Dec. 1	Nov. 14
do pref. B m	5c	Dec. 1	Nov. 14
do pref. BB m	50c	Dec. 1	Nov. 14
Indiana Pipe Line q	25c	Nov. 14	Oct. 23
Louisiana Oil pfd. q	$1.62½	Nov. 16	Oct. 31
National Refining q	12½c	Nov. 15	Nov. 1
Sinclair Cons. pfd. q	$2	Nov. 14	Nov. 5
Southern Pipe Line q	50c	Dec. 1	Nov. 16
Tide Water Oil pfd. q	$1.25	Nov. 16	Oct. 17
Union Oil Calif. q	50c	Nov. 10	Oct. 17

Paid Last Week

Company and Period	Amount	Date Paid
Cities Service m	2½c	Nov. 2
do stock m	½%	Nov. 2
do pfd. m	50c	Nov. 2
do pref. B m	5c	Nov. 2
do pref. BB m	50c	Nov. 2
Eureka Pipe Line q	$1	Nov. 2
Lone Star Gas pfd. q	$1.62	Nov. 2
Salt Creek Prod. q	25c	Nov. 2

New York Bonds

Week Ending Nov. 6

	High	Low	Last	Change
Asso. Oil gold 6s	101⅛	101⅛	101⅛	— ⅛
Atlantic Refg. deb. 5s	97½	96	97½	+1½
Cal. Pet. 5½s	87½	87½	87½	— ½
General Pet. 5s	102½	101	102	+ ⅜
Humble Oil & Refg. 5s	100¾	100	100⅝	+ ⅝
Humble Oil & Refg. 5½s	100⅝	100	100⅝	+ ⅛
Pan Amer. P & T 6s	101¾	101¾	101¾	0
Pan Amer P & T 6s	19¾	18	19	— ½
Phillips Pet. 5¼s	63½	57	63½	+8
Pure Oil 5½s	82½	79	82½	+5½
Pure Oil 5½s	82½	77	82½	+5
Richfield Oil of Calif. 6s	16½	13¼	16½	+3½
Shell Union Oil 5s	72½	64	71¾	+7¼
Shell Union Oil 5s with war.	74¼	65½	74¼	+9⅛
Sinclair Con. Oil 7s	90	82	90	+8
Sinclair Con. Oil 6½s	85½	76¾	85½	+8¾
Sinclair Con. Crude 5½s	99	97¼	99	+1¼
Sinclair Pipeline	99	96	99	+3¼
Skelly Oil 5½s	61	57	61	+4
S. O. N. J. 5s	102¼	101	102	+ ½
S. O. N. Y. 4½s	97½	94⅝	96½	+1½
Union Oil of Calif. 6s A	101½	101½	101½	0
Union Oil of Calif. 5s C	95	94¼	95	+1
Warner-Quinlan 6s	35	33	33	+2
White Eagle Oil 5½s	101⅝	101⅝	101⅝	0

Wisconsin Discontinues Equipment Lending

CLEVELAND, Nov. 5.—The Wisconsin code committee resolved against the lending and leasing of gasoline pumps and tanks as of Oct. 14. It also decided against selling such equipment to dealers under long term purchase contracts and against replacing existing equipment when it becomes unusuable. Equipment in leased accounts is excepted.

Lending of barrels or drums not exceeding 55 gallons' capacity, ordinary motor oil tanks, grease outfits not costing more than $50, and kerosine outfits is excepted.

All other dispensing equipment comes under the ban of the resolution. Existing equipment may remain in dealers' stations but without repair, servicing or addition of parts by the oil supplier.

Where the business of a loan pump and tank customer is acquired by a competitor company, the installed equipment may be sold to the new supplier on the following basis:

For pumps—Current market price less 20 per cent depreciation a year down to 50 per cent of the current market value.

For tanks—Current market value less 10 per cent depreciation a year down to 50 per cent of the current market value.

Reasonable installation costs are to be added for both pumps and tanks.

It is planned to discontinue lending grease outfits as soon as the consent of marketers of nationally known greases can be obtained.

C. F. Spangler, The Texas Co., is chairman of the Wisconsin committee. L. O. Woehrer is secretary.

New Appointments On Code Committees

NEW YORK—Several changes in membership of oil code committees have been announced by Edward G. Seubert, Standard Oil Co. of Indiana, chairman of the general committee of the American Petroleum Institute's division of refining.

These appointments are:

J. H. Brockington, The Texas Co., Columbia, S. C., member of the South Carolina committee, to succeed J. W. Dowdle, resigned.

T. M. Gordon, Standard Oil Co. of Louisiana, New Orleans, member of the Louisiana committee, to succeed J. V. Gresham, resigned.

C. B. Barrett, The Texas Co., Birmingham, Ala., and A. L. Maples, Alabama Oil Co., Florence, Ala., as members of the Alabama committee. Mr. Barrett succeeds J. J. Clark, resigned.

H. J. Tuckett, Shell Oil Co., San Francisco, as member of the Northern California committee, to succeed J. W. Miller, resigned.

L. G. McLaren, Shell Oil Co., Portland, Ore., as member of the Oregon committee to succeed P. E. Lakin, resigned.

E. W. Bolton, Standard Oil Co. of California, Seattle, as member of the Washington committee to succeed J. J. Valentine, resigned.

S. J. Wall, Shell Oil Co., Reno, Nev., as member of the Nevada committee to succeed W. M. Wilt, resigned.

All Oklahoma Stations Must Show License

TULSA, Nov. 5.—The Oklahoma State Tax Commission has adopted a rule that copies of distributors' licenses to distribute motor fuel must be displayed prominently at all retail and wholesale sales stations. At split account stations copies of licenses of each supplier must be shown so that they may be read from the customer's car seat.

The commission also revised regulations covering agricultural tax exemptions to make them more clear. In deference to oil company protests the commission abandoned its plan of retaining final authority to make exemptions on individual purchases.

Pacific Coast Fuel Oil Shipments Up in 1930

SAN FRANCISCO, Nov. 6.—Fuel oil marketed on the Pacific Coast (California, Oregon, Nevada, Washington and Arizona), declined 4,500,000 barrels in 1930, amounting that year to 137,241,000 barrels, compared with 141,740,260 barrels in 1929.

Shipments increased from 30,145,160 barrels in 1929 to 30,950,000 barrels in 1930, partially offsetting the decrease of 5,304,000 barrels in domestic deliveries. The latter declined from 111,595,100 barrels in 1929 to 106,291,255 barrels in 1930.

Railroads in the Pacific Coast district in 1930 used 26,613,550 barrels, compared with 29,610,000 barrels in 1929, being the second largest user of this product.

The largest user and one of the six among 19 industries to show a gain, was the steamships and tankers which used 38,778,115 barrels in 1930, compared with 36,001,810 barrels in 1929.

A large increase was reported by the textile industry, which used 41,500 barrels in 1930, compared with 16,000 barrels in 1929.

U. S. Navy and Army transports used 5,685,850 barrels in 1930, compared with 3,030,355 barrels in 1929.

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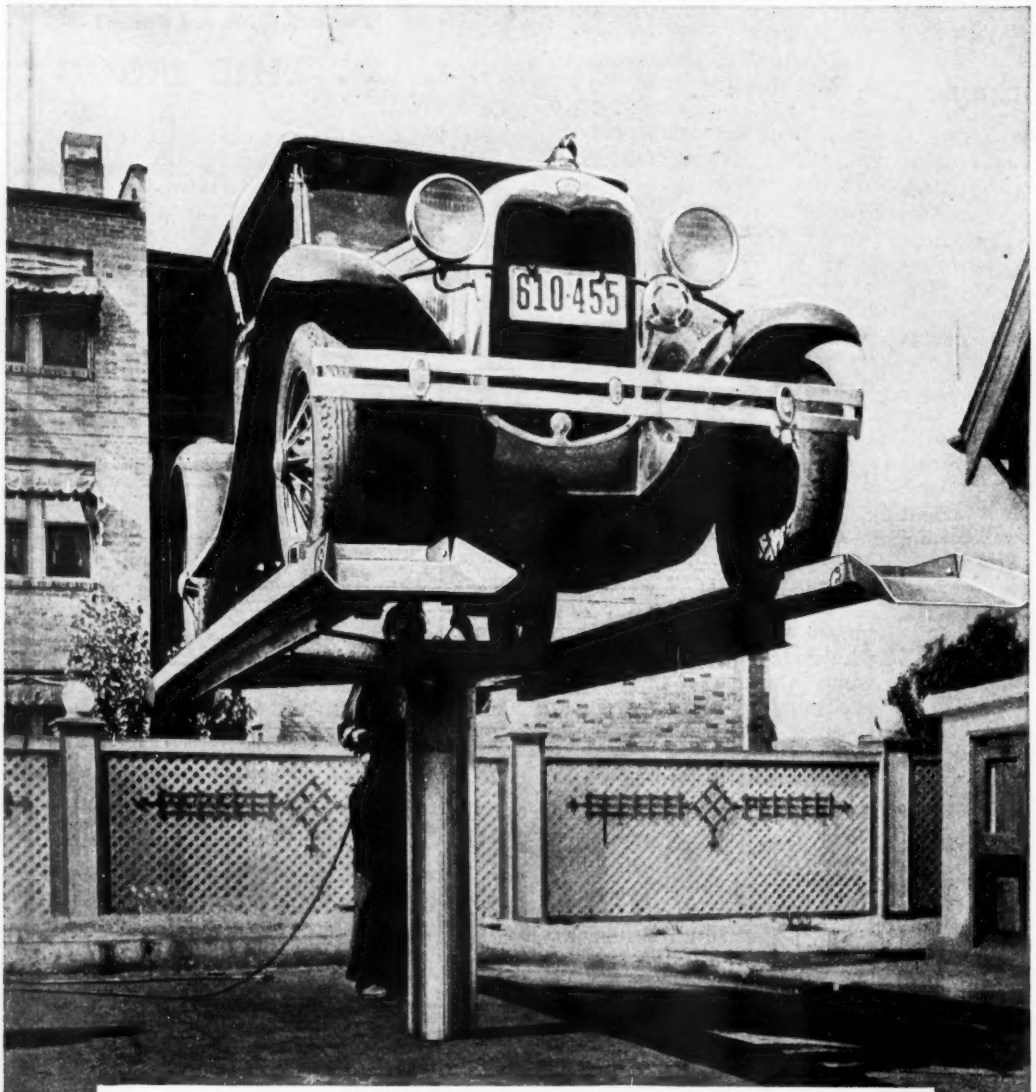


Strength! for Safety

In structural strength, the Curtis Lift is built like the Rock of Gibraltar. The platform construction is of structural steel, electrically welded, with ample excess strength for safety. No castings, with a possibility of blow holes, cold shuts or hidden defects. No Curtis Lift has ever had a structural break or collapse.

Roll-on platform made so attendant cannot get toes under edge when it lowers. Hinged ends are additional safeguards. Extra big plunger (9½ or 10½" diameter) provides greater strength and greater lifting capacity with lower pressure, than smaller type plungers.

Curtis "oil-locked" operating principle described in side column. Write for Curtis automotive equipment catalog.

Curtis Pneumatic Mchy. Co. 1965 Kienlen Ave. St. Louis

CURTIS

OIL-LOCKED LIFTS

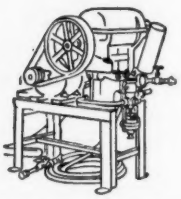
CARE WILL SAVE YOUR CAR

"OIL-LOCKED" CURTIS LIFTS

mean super-safety *at all heights*. When Curtis Lift is stopped, it rests on solid column of oil as incompressible as concrete. Oil is locked in by an oil-lock valve between supply tank and cylinder. No air in cylinder plunger and pipe line. Impossible for Curtis Lift to drop or settle.

Oil-lock unfailingly automatic. No one can neglect it. Lift can't lower unless both air-valve and oil-lock are operated. Oil-lock and air-valve are not under lift. Retard valve automatically controls safe lowering speed.

Packing gland at top of cylinder. No hidden leather cup to leak. Free-wheel, roll-on types. Also bus or truck sizes. Licensed under basic Lunati patents.



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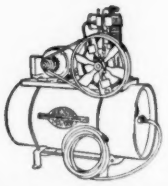
Fully enclosed slow-speed three-cylinder pump, specially designed by Curtis for car washing. Flooded and direct self-oiling systems. No grease cups. Automatic pressure governor. "V" belt drive.



CURTIS COMPRESSOR

Has Timken tapered roller bearings. Automobile type "V" belt drive. automatic centrifugal unloader. Universal motor mounting. All steel base. Improved "Centro Ring" oiling.

CURTIS AIR STANDS—Reel and tower types.